BOILER EXPLOSIONS

RETURN OF PAPERS RELATION TO EXPERIMENTS CONCERNING

1876

RETURN to an Order of the Honourable The House of Commons, dated 10 April 1876;—*for*,

RETURN "of PAPERS relating to EXPERIMENTS concerning BOILER EXPLOSIONS, conducted in 1874, under the Management of the late Superintendent Inspector General of Steam Vessels of the Treasury Department at *Washington*, together with the STATUTORY RULES concerning the Working of BOILERS in STEAM VESSELS in force in the UNITED STATES."

Board of Trade,
10 April 1876.

T. H. FARRER.

(*Sir Charles Adderley.*)

Ordered, by The House of Commons, *to be Printed*,
10 *April* 1876.

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RETURN of PAPERS relating to EXPERIMENTS concerning BOILER EXPLOSIONS, conducted in 1874, under the Management of the late Superintendent Inspector General of Steam Vessels of the Treasury Department at *Washington*, together with the STATUTORY RULES concerning the Working of BOILERS in STEAM VESSELS in force in the UNITED STATES.

— No. 1. —

(M. 7566.)

Mr. *McFarlane Gray* to Board of Trade.

St. Katherine Dockhouse, London,
14 April 1874.

Sir,

IT must interest the Board of Trade of a country that has a calamitous boiler explosion at least once a week all the year round, to know that the United States Government have voted large sums of money to be expended in experiments to ascertain the causes of boiler explosions and the best means of preventing them.

About 100,000 dollars will be spent this year in those experiments. I am, in my private capacity, a correspondent of the United States Commission, and have at their request co-operated with them in suggestions as to the objects and methods of the experiments.

In that capacity I have been invited to witness the experiments. When that invitation was first named to me, I suggested that an invitation ought to be sent to our Board of Trade to send one of their officers to be associated with the Commission. Immediately on the receipt of my letter they forwarded that invitation by cable, so cordially did they entertain the proposition. On the receipt of the Board's reply, declining the invitation, they sent me the enclosed resolution.

I have, &c.
(signed) *J. McF. Gray.*

The Assistant Secretary,
Marine Department, Board of Trade.

Enclosure in No. 1.

Treasury Department, Washington, D.C.,
5 February 1874.

Dear Sir,

IT is with great pleasure that I communicate to you the following resolution, passed unanimously by the United States Experimental Steam Boiler Commission, viz.:—

"*Resolved*,—That the President of the Commission be requested to extend to J. McFarlane Gray, Esq., a cordial invitation to be present at the experiments of the Commission the coming season, and he be also requested to invite to accompany him such associate or associates (engineers) as in his judgment would be advisable."

Permit me to hope that you may find it convenient to be present at our experiments during the coming season.

The experiments will be resumed, probably, in the month of April.

Very respectfully, &c.
(signed) *D. D. Smith*,
Superintendent Inspector General, and
Chairman Experimental Commission.

J. McFarlane Gray, Esq.,
London, England.

— No. 2. —

(M. 7566.)

Board of Trade to Mr. *McFarlane Gray.*

Board of Trade, Whitehall Gardens,
1 July 1874.

Sir,

I AM directed by the Board of Trade to instruct you to proceed, as soon as you can conveniently make the necessary arrangements, to New York, to witness certain experiments with regard to boiler pressure, which are being carried out by the United States Government.

In carrying out this instruction, I am to request that you will be careful to take full and detailed notes of all the experiments at which you may be present, with the view to their being generally useful to this Board, and that you will furnish them with a complete report of your proceedings and conclusions in connection with your visit. In this matter you are entirely the officer of this Board, and you are to act for this Board and for this Board only, and it is the wish and distinct instruction of the Board that no report or notes, or expression of opinion in connection with the subject are to be furnished to any person other than to myself.

I am, &c.
(signed) *Thomas Gray.*

J. McF. Gray, Esq.,
Chief Examiner of Engineers,
St. Katherine Dockhouse, Tower Hill, E.

— No. 3. —

(M. 7566.)

Board of Trade to Sir *E. Thornton*, K.C.B.

Board of Trade, Whitehall Gardens,
14 July 1874.

Sir,

I AM directed by the Board of Trade to inform you that they have instructed Mr. J. McFarlane Gray, one of this Board's Surveyors of Steamships, to proceed to the United States to witness the experiments being carried out by the United States Government, as to boiler explosions, &c., and to state that they will feel greatly obliged if you will afford that officer such facilities as may be in your power to enable him to make a complete report to this Department of the results of such experiments.

I am to add that Mr. McFarlane Gray proceeds to New York by one of the Inman line of steamships in the course of the current week.

I am, &c.
(signed) *Thomas Gray.*

Right Hon. Sir E. Thornton, K.C.B.,
Washington, United States.

Note.—A letter to the same effect was sent to D. D. Smith, Esq., President of the United States Experimental (Boiler) Commission.

— No. 4. —

(M. 15,846.)

Mr. *McFarlane Gray* to Board of Trade.

London, 29 October 1874.

Sir,

IN accordance with your instructions, I set out from London on 14th July to go to New York, *viâ* Liverpool. I went in the steamship "City of Richmond," leaving Liverpool on the 16th, and I arrived at New York on Sunday morning, 26th July.

27th July,

27th July, reported myself to Mr. Copeland, one of the members of the Explosion Commission. He explained to me that although they had expected to be at work before the month of July, certain difficulties had arisen in procuring the necessary special instruments without which the results of the experiments would be in a great measure lost. To decide what the instruments should be had been the first difficulty, but when that was settled a greater difficulty presented itself, the chairman refused to sanction the expenditure required for their purchase. He objected to do anything beyond making boilers, and bursting them with as much noise and before as many spectators as possible. Special instruments, he considered, were quite unnecessary for that purpose; further, he was the Commission, and the others were only practical men appointed to assist him as he might direct; he was the inspector general and chairman of the Commission, and he passed all accounts and authorised all disbursements, without any co-operation on the part of the members of the Commission.

This conduct of the chairman had brought the business of the Commission to a standstill, and it was beginning to be suspected that the accounts would not bear to be examined, and that the money had not been properly husbanded. As the chairman resisted their demand to see the accounts, the members of the Commission had appointed a deputation to apply to the Treasury Department for an investigation into the pecuniary transactions of the Commission, and for a recognition of the equal authority vested in the members of the Commission and in the chairman. I was invited to accompany the deputation to Washington, when I could report my arrival to the chairman of the Commission and at the British Legation.

On Wednesday, 29th July, we went to Washington. On the evening of that day I was introduced to Mr. D. D. Smith, the Supervising Inspector General, chairman of the Commission. He said he had received the Board of Trade's letter, and welcomed me to their country. His mind was evidently not in his words to me; it seemed to be wholly occupied with his own business, knowing that the two gentlemen who were with me had come to Washington to oust him if they could. Next day it was announced in the papers that Mr. Smith had been dismissed from the two appointments which he held. In a day or two it was known that he had applied for leave to send in his resignation instead of being dismissed. Permission to do so was granted, his resignation to take effect on the 1st September. In a week or two his political friends had mustered an influential party, which petitioned that he should be permitted to withdraw his resignation, but this was not allowed.

The accounts were found to be in a most unsatisfactory state; the greater part of the appropriation money was already expended and there was almost nothing to show for it.

In the previous season Mr. Smith had suggested as a useful experiment that an old boiler should be burst just as it was when last running. He had one he was about removing from one of his boats, and he proposed that it should be burst at the experimental grounds. The Commission considered his offer an acceptable one, as it would enable them, at almost no expense, to obtain some valuable results directly bearing upon steamboat boiler inspection. A crowd of spectators were gathered together to see a real boiler burst by steam. Mr. Smith had all his friends there, and liberally provided first-class luncheon and the best champagne, conveying those invited by his tug-boat with its new boiler in it. Two or three attempts at first failed to burst the shell, the fires going out before a sufficient pressure was reached. Mr. Smith urged that the boiler must be burst, as it would never do to send away all the people again; and, without taking time to examine and carefully record the effect of the first steam tests, they forced the fires to get up an explosion to time, much as a 4th of July fireworks exhibition; and at last the boiler was burst, and that is about all that can be said about it. When the accounts were examined it was at once discovered that the profuse liberality of the chairman to his invited friends was all at the expense of the appropriation money; the refreshments had been provided by stores in which he had an interest, and charged at extravagant prices; the old boiler was also charged for at a fancy price by a boiler-maker to whom Mr. Smith had sold it, and finally, he had charged 400 dollars per day for the use of the tug-boat. The rest of the accounts were all on the same pattern, and Mr. Smith was at once removed from both his offices, and the Commissioners were requested to nominate a successor to the chairmanship. As this examination took place in the beginning

ning of August, and Mr. Smith's resignation was to date from the 1st September, a successor could not be appointed until the latter date.

On my return to New York I visited the experimental grounds with one of the Commission, and, as far as practicable, arrangements were talked over to begin experimenting early in September. There are six boilers in place, almost ready for lighting fires, and all that was necessary seemed to be repairing the bomb proof and fixing the instruments. Mr. Copeland, who was with me, was confident we could get through a deal of work before winter set in, if the new chairman were only appointed and proper instruments procured.

In the end of August, when the new chairman was still not appointed, I learned that Mr. Smith had not forwarded Board of Trade's letter to the Treasury, and I was in doubt as to how I should act. Mr. Copeland was then going to Washington to have the business fixed, and I accompanied him, to see the Secretary of the Treasury about my own proceedings. The Secretary regretted the awkward turn the affairs of the Commission had taken, expressed his desire that the work should be carried on energetically as soon as the necessary appointment was made, and he hoped I should be able to attend all the experiments, that the Commission might have the benefit of my co-operation, and that the results would be valuable both to British and to American engineers.

I understand that the Secretary intimated to the Commission that the appropriation money can be increased if the Commission show valuable results.

In the first week of September, at the suggestion of the Commissioners, Professor Joseph Winlock of Harvard University was invited to accept the chairmanship of the Commission.

This choice was influenced by the consideration of the importance of having the assistance of a man of high scientific attainment who was accustomed to operate with exact self-recording instruments as in our observatories. Professor Winlock has the Chair of Astronomy at Harvard, he had been consulted by the Commission's Committee on instruments, and from that experience of his qualifications it is believed that he will be a valuable assistance to the Commission, in digesting the results they may obtain, and in contriving instruments to register the pressures and temperatures influencing the explosions.

Professor Winlock's appointment coming to him quite unexpectedly, he being, the secretary told him, the first man he had ever appointed to a post for which he had not applied, he had to take a few days to consider what it was he was asked to become, and to understand its duties. By the middle of September he had accepted, and the Commission met at Washington on the 16th September for reorganisation and to investigate accounts, intending to adjourn to Pittsburg experimental grounds, where I was to meet them.

On the 21st September the adjourned meeting was held at Pittsburg; I was present. There are here also six boilers, four of them in place and two not placed. After carefully considering the condition of the boilers and the kind of instruments requisite for the work, to render the experimental results valuable in proportion to the great expenditure of money voted for them, it was considered that it would be impossible to do more than merely make a beginning in the few weeks that would be available for out-of-door experiments before winter set in. It was, therefore, decided to postpone the explosions till the spring of 1875, and in the meantime to be procuring the best instruments that skill and money could provide, to be ready for operations then without delay. I undertook to obtain for them full particulars of the Siemen's thermometer which I had seen used in this country, and of any other instrument that might be applicable to their purpose.

I returned to New York on the 26th September, and left on the 30th by the steamship "Algeria," arriving at London on the 10th October, and reported myself at my office on Monday, 12th October.

The preceding is the complete statement of my mission to the United States in reference to experiments on steam boiler strength.

I am, &c.

The Assistant Secretary, (signed) *J. McF. Gray.*
Marine Department, Board of Trade.

— No. 5. —

(M. 15,846.)

Board of Trade to Mr. *McFarlane Gray.*

Board of Trade, Whitehall Gardens,
1 December 1874.

Sir,

I AM directed by the Board of Trade to convey to you their thanks for your report of the 29th October with reference to your mission to the United States respecting experiments on steam boiler strength.

I am, &c.
(signed) *Thomas Gray.*

J. McFarlane Gray, Esq.,
St. Katherine Dockhouse, Tower Hill, E. C.

— No. 6. —

LAWS, RULES, and REGULATIONS relating to the Inspection of STEAM VESSELS.
April 1873.

ACT of CONGRESS relating to STEAM VESSELS.—Approved 28 February 1871.

CHAPTER C.

AN ACT to provide for the better Security of Life on Board of Vessels propelled in whole or in part by Steam, and for other Purposes.

BE it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That no license, register, or enrolment shall be granted, or other papers issued, by any collector or other chief officer of the Customs, to any vessel propelled in whole or in part by steam, until he shall have satisfactory evidence that all the provisions of this Act have been fully complied with; and if any such vessel shall be navigated without complying with the terms of this Act, the owner or owners thereof shall forfeit and pay to the United States the sum of five hundred dollars for each offence, one-half for the use of the informer, and for which sum the steamboat or vessel so engaged shall be liable, and may be seized and proceeded against by way of libel in any district court of the United States having jurisdiction of the offence.

No papers to be issued to any vessel propelled in whole or in part by steam, until the provisions of this Act are complied with.

Penalty for non-compliance.

Sect. 2. And be it further enacted, That every steamer so propelled, and carrying passengers or freight, shall be provided with suitable pipes and valves attached to the boiler to convey steam into the hold and the different compartments thereof to extinguish fire; and every stove used on board of any such vessel shall be well and securely fastened, so as to prevent it from being moved or overthrown, and all woodwork or other ignitible substances about the boilers, chimneys, cook-houses, and stovepipes exposed to ignition shall be thoroughly shielded by some incombustible material, in such a manner as to leave the air to circulate freely between such material and woodwork or other ignitible substance; and before granting a certificate of inspection, the inspector shall require all other necessary provisions to be made throughout such vessel to guard against loss or danger from fire.

Such steamers to be provided with pipes, &c., to convey steam to extinguish fire.

Stoves.

Woodwork about boilers, &c.

Duty of inspector in this matter.

Sect. 3. And be it further enacted, That every steamer permitted by her certificate of inspection to carry as many as fifty passengers, or upwards, or any steamer carrying passengers, and which shall also carry cotton, hay, or hemp, shall be provided with a good double-acting steam fire pump, or other equivalent apparatus, for throwing water; said pump or other apparatus for throwing water shall be kept at all times and at all seasons of the year in good order and ready

Certain passenger steamers to be provided with steam fire pumps, &c., to be always ready for use.

Suitable hose.

for immediate use, having at least two pipes of suitable dimensions, one on each side of the vessel, to convey the water to the upper decks; to these pipes there shall be attached, by means of stop cocks or valves, both between decks and on the upper deck, good and suitable hose of sufficient strength to stand a pressure of not less than one hundred pounds to the square inch, long enough to reach to all parts of the vessel, and properly provided with nozzles, and kept in good order and ready for immediate service. And every steamer exceeding two hundred tons burden and carrying passengers, shall be provided with two good double-acting fire pumps, to be worked by hand; each chamber of said pumps shall be of sufficient capacity to contain not less than one hundred cubic inches of water; said pumps shall be placed in the most suitable parts of the vessel for efficient service, having suitable well-fitted hose to each pump, of at least one-half the vessel in length, kept at all times in perfect order, and shipped up, and ready for immediate use; and on every such steamer not exceeding two hundred tons, one of such pumps may be dispensed with, and each fire pump thus provided for shall be supplied with water by means of a suitable pipe connected therewith, and passing through the side of the vessel so low as to be at all times under water when she is afloat; and no fire pump thus provided for shall be placed below the lower deck of any such vessel; and every steamer shall be provided with a pump which shall be of sufficient strength and suitably arranged to test the boilers thereof. But the capacity of one hundred cubic inches, as herein required, shall not apply to steamers now in service.

Certain passenger steamers to be provided with two fire pumps.

Where to be placed, &c.

When one pump may be dispensed with.

No fire pump to be below lower deck.

Pump to test boilers.

Provision not to apply to steamers now in service.

Sect. 4. And be it further enacted, That no loose hay, loose cotton, or loose hemp, camphene, nitro-glycerine, naphtha, benzine, benzole, coal oil, crude or refined petroleum, or other like explosive burning fluids, or like dangerous articles, shall be carried as freight or used as stores on any steamer carrying passengers; nor shall baled cotton or hemp be carried on such steamers unless the bales are compactly pressed and thoroughly covered with bagging or similar fabric, and secured with good rope or iron bands; and every bale of cotton or hemp that shall be shipped or carried on any passenger steamer without conforming to the provisions of this section shall be subject to a penalty of five dollars; which bales shall be liable to seizure and sale to secure the payment of such penalty; nor shall gunpowder be carried on any such vessel, except in case of special license granted by inspectors as hereinafter provided; nor shall oil of vitriol, nitric or other chemical acids be carried on such steamers except on the decks or guards thereof, or in such other safe part of the vessel as shall be prescribed by the inspectors. Refined petroleum which will not ignite at a temperature less than one hundred and ten degrees of Fahrenheit thermometer, may be carried on board such steamers upon routes where there is no other practical mode of transporting it, and under such regulations as shall be prescribed by the Board of Supervising Inspectors, with the approval of the Secretary of the Treasury, and oil or spirits of turpentine may be carried on any such steamer when the same shall be put up in good metallic vessels, or casks or barrels well and securely bound with iron, and stowed in a secure part of the vessel; friction matches may also be carried on such steamers when securely packed in strong tight chests or boxes, the covers of which shall be well secured by locks, screws, or other reliable fastenings, and stowed in a safe part of the vessel, at a secure distance from any fire or heat; and all such other provisions shall be made on every steamer carrying passengers or freight to guard against and extinguish fire as shall be prescribed by the Board of Supervising Inspectors, and approved by the Secretary of the Treasury: Provided, That the Secretary of the Treasury may grant permission to the owner of any steam vessel for the use of any invention or process for the utilisation of petroleum or other mineral oils or substances in the production of motive power, and he shall have power to make and enforce regulations concerning the application and use of the same for such purpose; and no permission shall be granted unless upon the certificate of the Supervising Inspector of steamboats for the district wherein said vessel is registered, and other satisfactory proof that the use of the same is safe and efficient; and upon such proof, and the approval of such certificate by the Secretary of the Treasury, a special license for the use of such process or invention, as aforesaid, shall issue under the seal of the Treasury Department.

Certain dangerous articles not to be carried as freight or used as stores on passenger steamers.

Baled cotton and hemp.

Penalty.

Gunpowder, vitriol, nitric acid, &c.

Refined petroleum.

Spirits of turpentine.

Friction matches.

Special license for the use of any invention, &c., for the utilisation of petroleum, &c., in the production of motive power.

Sect. 5. And be it further enacted, That all gunpowder, nitro-glycerine, camphene, naphtha, benzine, benzole, coal oil, crude or refined petroleum, oil of vitriol,

Gunpowder, &c., how to be packed for shipment.

vitriol, nitric or other chemical acids, oil or spirits of turpentine, friction matches, and all other articles of like character, when packed or put up for shipment, shall be securely packed and put up separately from each other and from all other articles, and the package, box, cask, or other vessel containing the same shall be distinctly marked on the outside with the name or description of the article contained therein; and every person who shall pack or put up, or cause to be packed or put, up for shipment any gunpowder, nitro-glycerine, camphene, naphtha, benzine, benzole, coal oil, crude or refined petroleum, oil of vitriol, nitric or other chemical acids, oil or spirits of turpentine, friction matches, or other article of like character, otherwise than as aforesaid, or shall knowingly ship or attempt to ship the same, or shall deliver the same to any such vessel as stores, unless packed and marked as aforesaid, shall be deemed guilty of a misdemeanour, and, upon conviction thereof by any court of competent jurisdiction, shall be punished by fine not exceeding two thousand dollars, or imprisonment not exceeding eighteen months, or both, one-half of the fine to go to the informer, and the articles to be liable to seizure and forfeiture.

Penalty for packing, &c., in any other manner.

Sect. 6. And be it further enacted, That every vessel so propelled by steam and carrying passengers during the night time shall keep a suitable number of watchmen in the cabins and on each deck, to guard against fire or other dangers, and to give alarm in case of accident or disaster, and for every neglect of this duty the license of the officer in charge of the vessel for the time being shall be revoked; and the Board of Supervising Inspectors may require every such steamer, and also steamers carrying freight, to be provided with such number and kind of good and efficient portable fire-extinguishers as in the judgment of the Board may be necessary to protect them from fire when such steamers are moored or lying at a wharf, without steam to work the pumps; and if any owner of such vessel shall neglect or refuse to furnish the requisite number of men necessary to keep watch as herein required, he shall be fined one thousand dollars.

Passenger steamers to have watchmen in cabins, &c., during the night time.

License of officer to be revoked for neglect.

Fire extinguishers when steamers are without steam to work the pumps.

Penalty.

Sect. 7. And be it further enacted, That every steam vessel navigating rivers only (except ferry boats, freight boats, canal boats, and towing boats of less than fifty tons) shall have at least one good, substantial boat, with lines attached, and properly supplied with oars, and kept in good condition at all times and ready for immediate use; and in addition thereto, every such steamer carrying passengers shall have one or more metallic lifeboats, fireproof, and in all respects good and substantial boats, of such dimensions and arrangements as the Board of Supervising Inspectors by their rules and regulations shall prescribe, which boats shall be carried in the most convenient manner so as to be brought into immediate use in case of accident: Provided, that where the character of the navigation is such that in the opinion of the supervising inspector the metallic lifeboats can be dispensed with, he is hereby authorised to exempt any such steamer from carrying the same, or may require a substitute thereof, at his discretion.

River steamers, except, &c., to have small boat with oars.

Carrying passengers, to have metallic lifeboats.

Where to be carried.

When metallic lifeboats may be dispensed with or substitute provided.

Sect. 8. And be it further enacted, That every such vessel carrying passengers shall be provided with a good life-preserver, made of suitable material, for every cabin passenger for which she will have accommodation, and also a good life-preserver or float for each deck or other class passenger which the inspector's certificate shall allow her to carry, including the officers and crew, which life-preservers or floats shall be kept in convenient and accessible places on such vessel in readiness for immediate use in case of accident; and every such vessel of two hundred tons or less, shall also keep at least eighteen fire buckets and two barrels, and shall have not less than four axes; and every such steamer of over two hundred tons, and not less than five hundred tons burden, shall carry not less than twenty-four buckets, four water barrels, and six axes; and every such steamer of over five hundred tons shall carry not less than thirty-five buckets, six water barrels, and eight axes. The buckets and barrels shall be kept in convenient places and filled with water, to be in readiness in case of fire, and the axes shall be kept in good order and ready for immediate use: Provided, however, that tanks of suitable dimensions and arrangement, or buckets in sufficient number, may be substituted for barrels.

Life preservers or floats.

Fire buckets, water-barrels, and axes.

Where to be kept.

Tanks, &c., substitutes for barrels.

Sect. 9. And be it further enacted, That every such vessel carrying passengers on the main deck shall be provided with permanent stairways and other sufficient means convenient to such passengers, for their escape to the upper deck, in case

Convenient permanent stairways from main deck to upper deck.

Gangways to be left clear in stowage of freight.

Space for deck passengers not to be overcrowded or occupied by freight.

Penalty.

of the vessel sinking or other accident endangering life; and in the stowage of freight upon such deck, where passengers are carried, gangways or passages, sufficiently large to allow persons to pass freely through them, shall be left open both fore and aft of the vessel, and also to and along the guards on each side; and it shall be the duty of the captain or mate of such vessel to assign to all deck passengers when taking passage the space on deck they may occupy during the voyage, and such space shall not thereafter be occupied by freight, nor overcrowded by other persons, nor shall freight be stowed about the boilers or machinery in such a manner as to obstruct or prevent the engineer from readily attending to his duties; and for every violation of this section relating to the carriage and accommodation of passengers, the owners of the vessel shall pay a fine of three hundred dollars.

Wire tiller-ropes and bell pulls, speaking tubes, &c.

Compass not to be disturbed.

Sect. 10. And be it further enacted, That every steamer carrying passengers shall be provided with wire tiller ropes, or iron rods or chains, for the purpose of steering and navigating the vessel, and shall employ wire bell pulls for signalizing the engineer from the pilot house, together with tubes of proper size so arranged as to return the sound of the engine bells to the pilot house, or other arrangements to repeat back the signal: Provided, that on any such vessel, navigated by the mariner's compass, so much of such wire rope or chain may be dispensed with and disused as shall influence or disturb the working of such compass.

Offices of unqualified local inspectors vacated.

Appointment of local inspectors.

Board of designators.

Qualifications and attainments of inspectors of hulls.

Of inspectors of boilers.

Inspector of hulls and of boilers when approved, &c., to constitute Board of local inspectors.

Sect. 11. And be it further enacted, That upon the passage of this Act the offices of all local inspectors who have not the qualifications prescribed in this Act shall be deemed vacated, and that when any vacancy shall occur in any local Board of inspectors now existing, or whenever local inspectors are to be appointed for a new district, the supervising inspector shall notify the collector or other chief officer of the Customs for the district, and the judge of the district court of the United States for the district in which such appointment is made, who, together with the supervising inspector, shall meet together as a Board of designators; and it shall be the duty of such Board, or the major part thereof, one of which majority shall be the supervising inspector, when designating an inspector of hulls, to select a person of good character and suitable qualifications and attainments, to perform the services required of him by this Act, who, from his practical knowledge of shipbuilding and navigation and the uses of steam in navigation, shall be fully competent to make a reliable estimate of the strength, seaworthiness, and other qualities of the hulls of steamers and their equipment deemed essential to safety of life in the navigation of such vessel, to be called the inspector of hulls; and when designating an inspector of boilers, to select a person of good character and suitable qualifications and attainments to perform the services required of him by this Act, who, from his knowledge and experience of the duties of an engineer employed in navigating vessels by steam, and also in the construction and use of boilers and machinery, and appurtenances therewith connected, shall be able to form a reliable opinion of the strength, form, workmanship, and suitableness to such boilers and machinery to be employed without hazard to life, from imperfection in the material, workmanship, or arrangement of any part of such apparatus for steaming, to be called the inspector of boilers; and these two persons, when approved by the Secretary of the Treasury, shall, from the date of designation, constitute a Board of local inspectors, and shall be empowered and required to perform the duties herein specified, to wit:

Their duties in inspection of hulls.

First. Upon application in writing of the master or owner they shall, once in every year at least, carefully inspect the hull of each steamer within their respective districts, and shall satisfy themselves that every such vessel so submitted to their inspection is of a structure suitable for the service in which she is to be employed, has suitable accommodation for passengers and the crew, and is in a condition to warrant the belief that she may be used in navigation as a steamer, with safety to life, and that all the requirements of law in regard to fires, boats, pumps, hose, life-preservers, floats, anchors, cables, and other things, are faithfully complied with; and if they deem it expedient, they may direct the vessel to be put in motion, and may adopt any other suitable means to test her sufficiency and that of her equipment.

Of boilers.

Second. They shall also inspect the boilers of all steamers before the same shall

shall be used and once at least in every year thereafter, subjecting them to the hydrostatic pressure prescribed by this Act, and satisfy themselves by thorough examination that the boilers are well made, of good and suitable material; that the openings for the passage of water and steam, respectively, and all pipes and tubes exposed to heat, are of proper dimensions and free from obstruction; that the spaces between and around the flues are sufficient, and that the flues are circular in form, and the fire-line of the furnace is at least two inches below the prescribed minimum water-line of the boilers; and that the arrangement for delivering the feed-water is such that the boilers cannot be injured thereby; and that such boilers and the machinery, and the appurtenances, may be safely employed in the service proposed in the written application without peril to life; and shall also satisfy themselves that the safety-valves are of suitable dimensions, sufficient in number, and well arranged (one of which may, if necessary, in the opinion of the inspectors, to secure safety, be taken wholly from the control of all persons engaged in navigating such vessel, and secured by the inspectors), and that the weights of the safety-valves are properly adjusted, so as to allow no greater pressure in the boilers than the amount prescribed by the inspection certificate; that there is a sufficient number of gauge-cocks properly inserted, and to indicate the pressure of steam, suitable steam registers that will correctly record each excess of steam carried above the prescribed limit and the highest point attained, which shall be taken wholly from the control of all persons engaged in navigating such vessel, and secured by the inspectors, and reliable low-water gauges; and that fusible metals are properly inserted so as to fuse by the heat of the furnace when the water in the boilers shall fall below its prescribed limits; and that adequate and certain provision is made for an ample supply of water to feed the boilers at all times, whether such vessel is in motion or not, so that in high-pressure boilers the water shall not be less than four inches above the top of the flues; and also that means of blowing out are provided, so as to thoroughly remove the mud and sediment from all parts of the boilers when they are under pressure of steam: Provided, however, that no kind of instrument, machine, or equipment, for the better security of life, provided for by this Act, shall be used on any such vessel which shall not first be approved by the Board of Supervising Inspectors, and also by the Secretary of the Treasury.

No kind of instrument, &c., to be used until first approved by the Board of Supervising Inspectors and the Secretary of the Treasury.

Third. That in subjecting to the hydrostatic tests boilers called and usually known under the designation of high-pressure boilers, the inspector shall assume one hundred and ten pounds to the square inch as the maximum pressure allowable as a working power for a new boiler forty-two inches in diameter, made in the best manner, of inspected iron plates, one-fourth of an inch thick, and of a quality required by law, and shall rate the working power of all high-pressure boilers, whether old or new, according to their strength, compared with this standard, and in all cases the test applied shall exceed the working power allowed in the ratio of one hundred and sixty-five to one hundred and ten; and in subjecting to the test aforesaid that class of boilers usually designated and known as low-pressure boilers, the said inspectors shall allow as a working power of each new boiler a pressure of only a pressure of only three-fourths the number of pounds to the square inch to which it shall have been subjected by the hydrostatic test, and found to be sufficient therefor; but should such inspectors be of the opinion that said boiler, by reason of its construction or material will not safely allow so high a working pressure, they may, for reasons to be stated specially in their certificate, fix the working pressure of said boiler at less than three-fourths of said test pressure; but all boilers used on steam-vessels, and constructed of iron or steel plates, inspected under the provisions of Section 36 of this Act, shall be subjected to a hydrostatic test, in the ratio of one hundred and fifty pounds to the square inch to one hundred pounds to the square inch of the working steam-power allowed; and no boiler or pipe, or any of the connections therewith, shall be approved which is made, in whole or in part, of bad material, or is unsafe in its form, or dangerous from defective workmanship, age, use, or other cause.

Testing of high pressure boilers.

Maximum pressure.

Test.

Of low-pressure boilers.

Working power.

All boilers on steam-vessels to be subject to what hydrostatic test.

Certain boilers, &c., not to be approved.

Fourth. When the inspection is completed, and the inspectors approve the vessel and her equipment throughout, they shall make and subscribe a certificate to the collector or other chief officer of the Customs of the district in which such inspection shall be made, in accordance with such form and regulations as the Board of Supervising Inspectors shall prescribe; which certificate shall be verified by

Certificate of approval by inspectors.

To be verified by oath.

Reasons of disapproval to be in writing.

by the oaths of the inspectors signing it, before the chief officer of the Customs of the district, or any other person competent by law to administer oaths; and in case the said inspectors refuse to grant a certificate of approval, they shall state in writing, and sign the same, their reason for their disapproval.

License to carry gunpowder.

Sect. 12. And be it further enacted, That upon the application of any master or owner of any steamer employed in the carriage of passengers, for a license to carry gunpowder, the said inspectors shall examine such vessel, and if they find that she is provided with a chest or safe composed of metal, or entirely lined and sheathed therewith, or if the vessel has one or more compartments, thoroughly lined and sheathed with metal, at a secure distance from any fire, they may grant a certificate to that effect, authorising such vessels to carry as freight, within such chests, safes, or compartments, the article of gunpowder.

Record of certificates of inspection of vessels, &c.

Record of certificates authorising gunpowder to be carried as freight.

Of licenses to captains, engineers, &c., and of refusals to license and suspensions, &c., of licenses.

Sect. 13. And be it further enacted, That the said inspectors shall keep a record of certificates of inspection of vessels, their boilers, engines, and machinery, and all of their acts in their examinations and inspection of steamers, whether of approval or disapproval, and when a certificate of approval is recorded, the original shall be delivered to the collector or other chief officer of the Customs of the district: they shall also keep a like record of certificates authorising gunpowder to be carried as freight by any steamer carrying passengers, and shall keep a like record of all licenses granted to captains, mates, pilots, and engineers, and of all refusals of the same; also, of all suspensions and revocations of license; also, of all refusals, suspensions, or revocations of which they shall receive notices from other districts; and shall report to the supervising inspector of their respective districts, in writing, their decisions in cases of refusal of licenses, or the suspension or revocation thereof, and all testimony received by them in such proceedings. They shall also report promptly to such supervising inspector all violations of the steamboat laws that shall come to their knowledge.

Violations of steamboat laws to be reported to supervising inspector.

Captains, engineers, pilots, &c., to be licensed and classified.

Not to be employed unless licensed.

Passenger steamers not to leave port unless with sufficient officers and crew.

Proviso.

Sect. 14. And be it further enacted, That the inspectors shall license and classify the captains, chief mates, engineers, and pilots of all steam vessels, and it shall be unlawful to employ any person, or for any person to serve as a captain, chief mate, engineer, or pilot on any steamer, who is not licensed by the inspectors; and any one so offending shall forfeit one hundred dollars for each offence; and no steamer carrying passengers shall depart from any port unless she shall have in her service a full complement of officers and crew, sufficient at all times to manage the vessel, including the proper number of watchmen: Provided however, that if any such vessel, on her voyage, is deprived of the services of any licensed officer, without the consent, fault, or collusion of the master, owner, or of any person interested in the vessel, the deficiency may be temporarily supplied until others licensed can be obtained.

Duty of inspectors upon applications for license as captains of steam vessels.

Suspension, &c., of license.

Sect. 15. And be it further enacted, That when any person shall apply to be licensed as captain or master of steam vessels, the inspectors shall make diligent inquiry as to his character, and shall carefully examine the applicant as well as the proofs which he presents in support of his claim, and if they are satisfied that his capacity, experience, habits of life, and character are such as to warrant the belief that he can be safely intrusted with the duties and responsibilities of the station for which he makes application, they shall grant him a license authorising him to discharge such duties on any such vessel for the term of one year; but such license shall be suspended or revoked, upon satisfactory proof of bad conduct, intemperate habits, incapacity, inattention to his duties, or the wilful violation of any provision of this Act.

As chief mate of steam-vessels.

Suspension of liconses.

Sect. 16. And be it further enacted, That when any person shall apply for authority to be employed as chief mate of steam vessels, the inspectors shall require satisfactory evidence of the knowledge, experience, and skill of the applicant in lading cargo, the handling and stowage of freight, and shall examine him as to his knowledge and ability in navigation and managing such vessels, and all other duties pertaining to his station; and if satisfied of his qualifications and good character, they shall grant him a license, authorising him to perform such duties for the term of one year; but such license shall be suspended or revoked upon satisfactory proof of bad conduct, intemperate habits, unskilfulness, or want of knowledge of the duties of his station, or the wilful violation of any provisions of this Act.

As engineer of steamers.

Sect. 17. And be it further enacted, That when any person shall apply for authority to perform the duties of engineer of any steamer, the inspectors shall examine the applicant as to his knowledge of steam machinery, and his experience as an engineer, and also the proofs which he produces in support of his claim; and if, upon full consideration, they are satisfied that his character, habits of life, knowledge, and experience in the duties of an engineer, are all such as to authorise the belief that the applicant is a suitable and safe person to be entrusted with the powers and duties of such a station, they shall grant him a license authorising him to be employed in such duties for the term of one year, in which they shall assign him to the appropriate class of engineers; but such license shall be suspended or revoked upon satisfactory proof of negligence, unskilfulness, intemperance, or the wilful violation of any of the provisions of this Act; but if complaint be made against any engineer holding a license authorising him to take charge of the boilers and machinery of any steamer, that he has, through negligence or want of skill, permitted the boilers in his charge to burn or otherwise become in bad condition, or that he has not kept his engine and machinery in good working order, it shall be the duty of the inspectors, upon satisfactory proof of such negligence or want of skill, to revoke his license and assign such engineer to a lower grade or class of engineers, if they find him fitted therefor.

License of engineer of steamers may be revoked, if, &c.

Assignment to lower grade.

Duty of inspectors upon applications for license as pilot of steam vessels.

Sect. 18. And be it further enacted, That whenever any person claiming to be a skilful pilot of steam vessels shall offer himself for a license, the inspectors shall make diligent inquiry as to his character and merits, and if satisfied, from personal examination of the applicant, with the proof that he shall offer, that he possesses the requisite knowledge and skill, and is trustworthy and faithful, they shall grant him a license for the term of one year, to pilot any such vessel within the limits prescribed in the license; but such license shall be suspended or revoked upon satisfactory evidence of negligence, unskilfulness, or inattention to the duties of his station, or for intemperance, or the wilful violation of any provision of this Act. And every such captain, mate, engineer, and pilot who shall receive a license as aforesaid shall, when employed upon any such vessel, place his certificate of license (which shall be framed under glass) in some conspicuous place in such vessel, where it can be seen by passengers and others at all times; and for every neglect to comply with this provision by any such captain, mate, engineer, or pilot, he shall be subject to a penalty of one hundred dollars fine, or to the revocation of his license: Provided, that in cases where the captain or mate is also pilot of the vessel, he shall not be required to hold two licenses to perform such duties, but the license issued shall state on its face that he is authorised to act in such double capacity.

Suspension, &c., of license.

Certificate of license to be posted in a conspicuous place.

Penalty.

Where captain or mate is pilot also, two licenses not required.

Local boards of inspectors to investigate all acts of incompetency or misconduct.

Sect. 19. And be it further enacted, That the said local boards of inspectors shall investigate all acts of incompetency or misconduct committed by any such licensed officer, while acting under the authority of his license, and shall have power to summon before them any witness within their respective districts, and compel their attendance by a similar process as in the United States circuit or district courts; and such local inspectors are hereby authorised to administer all necessary oaths to any witnesses thus summoned before them, and after reasonable notice in writing given to the alleged delinquent, of the time and place of such investigation, the said witness shall be examined under oath touching the performance of his duties by any such licensed officer; and if the Board shall be satisfied that such licensed officer is incompetent, or has been guilty of misbehaviour, negligence, unskilfulness, or has endangered life, or wilfully violated any provision of this Act, they shall immediately suspend or revoke his license, and the chief officer of the Customs for the district shall pay out of the revenues received under the provisions of this Act such fees to the United States marshal for his services, and to any witness so summoned for his actual travel and attendance, as shall be officially certified to by any inspector hearing the case, upon the back of such summons, not exceeding the rate allowed for fees and to witnesses for travel and attendance in any circuit or district courts of the United States.

Powers in conducting such investigation.

Fees of marshal and witnesses.

If local inspectors refuse or revoke, &c. a license, the case may be examined anew by supervising inspector.

Sect. 20. And be it further enacted, That whenever any Board of local inspectors refuse to grant a license to any person applying for the same, or shall suspend or revoke the license of any captain, mate, engineer, or pilot, any person deeming himself

himself wronged by such refusal, suspension, or revocation, may, within thirty days thereof, on application to the supervising inspector of the district, have his case examined anew by such supervising inspector, and the local board shall furnish to the supervising inspector, in writing, the reasons for their doings in the premises; and such supervising inspector shall examine the case anew, and he shall have the same powers to summon witnesses and compel their attendance, and to administer oaths that are conferred on the local inspectors by the terms of this Act, and such witnesses and the marshal shall be paid in the same manner as hereinbefore provided for; and such supervising inspector may revoke, change, or modify the decision of such local board; and like proceedings may be had by any master or owner of any steam vessel in relation to the inspection of such vessel, or her boilers or machinery, by any such local board; and in case of repairs, and in any investigation or inspection where there shall be a disagreement between the local inspectors, the supervising inspector, when so requested, shall investigate and decide the case.

Proceedings in such cases.

In addition to annual inspections of steamers, other inspections to be made at proper times by local inspectors.

Sect. 21. And be it further enacted, That, in addition to the annual inspection, it shall be the duty of the local inspectors to examine, at proper times, steamers arriving and departing to and from their respective ports so often as to enable them to detect any neglect to comply with the requirements of law, and also any defects or imperfections becoming apparent after the inspection aforesaid, and tending to render the navigation of the vessels unsafe; and if they shall discover any omission to comply with the law, or that repairs have become necessary to make the vessel safe, the said inspectors shall at once notify the master in writing, stating in the notice what is required; and if the master deems the requirements unreasonable or unnecessary, he may apply for a re-examination of the case to the supervising inspector, as hereinbefore provided; and if the master or owner shall refuse or neglect to comply with the requirements of the local inspectors, and shall, contrary thereto, and while the same remains unreversed by the supervising inspector, employ the vessel by navigating her, the master and owners, and the vessel itself, shall be liable to the penalty as prescribed by the first section of this Act, and in addition thereto shall be liable for any damage to passengers and their baggage which shall occur from any defects as stated in the notice aforesaid. And all inspections and orders for repairs shall be promptly made by the inspectors, and, when it can be safely done in their judgment, they shall permit repairs to be made where those interested can most conveniently do them; and no inspectors of one district shall modify or annul the doings of the inspectors of another district in regard to repairs, unless there is a change in the state of things, demanding more repairs than were thought necessary when the order was made, nor shall the inspectors of one district license a person coming from another district, if such person has been rejected for unfitness or want of qualifications.

Re-examination by supervising inspector.

Penalty for navigating the vessel meanwhile.

Inspections and orders for repairs by inspectors.

Inspectors of one district not to modify the doings of those of another district.

When local boards of inspectors are to inspect steamers in other collection districts.

Sect. 22. And be it further enacted, That the said local boards, when so requested in writing by any master or owner, shall, under the direction of the supervising inspector, inspect steamers in other collection districts, where no such Board is established; and if a certificate of approval is not granted, no other inspection shall be made by the same or any other Board until the objections made by such local board and unreversed by the supervising inspector of the district are removed: Provided, however, that nothing herein contained shall impair the right of the inspectors to permit such vessel to go to another port for repairs, if in their opinion it can be done with safety.

Vessels may go to other ports for repairs, if, &c.

Supervising inspectors now in office to continue.

Vacancies to be filled by the Prefident, with, &c.

Sect. 23. And be it further enacted, That, in order to carry this Act fully into execution, the ten supervising inspectors now in office shall continue in commission; and whenever a vacancy occurs, from death, resignation, or removal, the President of the United States shall, with the advice and consent of the Senate, fill the vacancy by appointing a successor, who shall be selected for his knowledge, skill, and practical experience in the uses of steam for navigation, and is a competent judge of the character and qualities of steam vessels, and of all parts of the machinery employed in steaming. The said supervising inspectors and the supervising inspector general shall assemble together as a Board, once in each year, at the city of Washington, district of Columbia, on the third Wednesday in January, and at such other times as the Secretary of the Treasury shall prescribe, for joint consultation, and shall assign to each of the supervising inspectors, respectively

Supervising inspectors with supervising inspector general to meet as a Board once a year in Washington, &c.

Assignment of districts and making of rules, &c.

respectively, the limits of territory within which he shall perform his duties, and the said Board shall establish all necessary rules and regulations required to carry out in the most effective manner the provisions of this Act for the safety of life, which rules and regulations, when approved by the Secretary of the Treasury, shall have the force of law: Provided, however, that the supervising inspector for the district embracing the Pacific Coast shall not be under obligation to attend the meetings of the Board oftener than once in two years, and when he does not attend such meetings, he shall make his communications thereto, in the way of a report, in such manner as the Board shall prescribe.

Supervising inspector of the Pacific Coast.

Sect. 24. And be it further enacted, That each supervising inspector shall watch over all parts of the territory assigned to him, shall visit, confer with, and examine into the doings of the local boards of inspectors within his district, and shall instruct them in the proper performance of their duties; and shall, whenever he thinks it expedient, visit such vessels licensed, and examine into their condition, for the purpose of ascertaining whether the provisions of this Act have been observed and complied with, both by the Board of Inspectors and the masters and owners; and it shall be the duty of all masters, engineers, mates, and pilots of such vessels to answer all reasonable inquiries, and to give all the information in their power in regard to any such vessel so visited, and her machinery for steaming, and the manner of managing both.

Duties of each supervising inspector within his district.

Sect. 25. And be it further enacted, That, whenever a supervising inspector ascertains to his satisfaction that any master, mate, engineer, pilot, or owner of any such vessel fails to perform his duties according to the provisions of this Act, he shall report the facts in writing to the Board in the district where the vessel was inspected or belongs; and, if need be, he shall cause the negligent or offending party to be prosecuted; and if the supervising inspector has good reason to believe there has been, through negligence or any other cause, a failure of the Board who inspected the vessel to do its duty, he shall report the facts in writing to the Secretary of the Treasury, who shall cause immediate investigation into the truth of the complaint, and, if he deems the cause sufficient, shall remove the delinquent.

To report violations of the steamboat laws to local inspectors.

To report failure in duty of local inspector to the Secretary of the Treasury.

Sect. 26. And be it further enacted, That it shall be the duty of such supervising inspectors to see that the said several Boards within their respective districts execute their duties faithfully, promptly, and, as far as possible, uniformly in all places, by following out the provisions of this Act according to the true intent and meaning thereof; and they shall, as far as practicable, harmonise differences of opinion when they exist in different local boards.

To see that the local board do their duty.

Sect. 27. And be it further enacted, That the said supervising inspectors shall also visit collection districts in which there are no Boards of Inspectors, if there be any, where steamers are owned or employed, and each one shall have full power to inspect any such steamer or the boilers of such steamer in any such district, or in any district where, from distance or other cause, it is inconvenient to resort to the local board, and to grant certificates of approval, and to do and perform all the duties imposed upon local boards by this Act.

To visit collection districts where there are no local boards of inspectors.

Sect. 28. And be it further enacted, That it shall be the duty of the Board of Supervising Inspectors to establish such rules and regulations as may be necessary to make known in a proper manner to local inspectors, the names of all persons from whom licenses have been withheld, and the names of all whose licenses have been suspended or revoked; and also the names of all steam vessels neglecting or refusing to make such repairs as may be ordered under the provisions of this Act, and the names of all that have been refused certificates of inspection. And each supervising inspector shall report, in writing, at the annual meetings of the Board, the general business transacted in his district during the year, embracing all violations of the steamboat laws, and the action taken in relation to the same, all investigations and decisions by local inspectors, and all cases of appeal, and the result thereof; and the Board shall examine into all the acts of each supervising inspector and local board, and all complaints made against the same, in relation to the performance of their duties under the law, and the judgment of the Board in each case shall be entered upon their journal, and the Board shall, as far as possible, correct mistakes where they exist.

To establish rules and regulations to give certain information to local inspectors.

Supervising inspector to report the business of his district at annual meeting.

Acts and complaints to be examined.

Sect. 29. And be it further enacted, That it shall be the duty of the Board of Supervising

Rules for steam-vessels in passing each

other to be made by &c.

Supervising Inspectors to establish such rules and regulations to be observed by all steam-vessels in passing each other as they shall from time to time deem necessary for safety, two printed copies of which rules and regulations, signed by said inspectors, shall be furnished to each of such vessels, and shall at all times be kept up in conspicuous places in such vessels, which rules shall be observed both night and day. Should any pilot, engineer, mate, or master of any steam vessel neglect or wilfully refuse to observe such regulations so established, any delinquent so neglecting or refusing shall be liable to a penalty of fifty dollars, and to all damages done to any passenger, in his person or baggage, by such neglect or refusal.

Printed copies to be furnished each vessel.

Penalty for disobeying regulations.

Provisions of law to be enforced against all steamers by Customs officers and inspectors.

Penalty for delinquency.

Sect. 30. And be it further enacted, That it shall be the duty of the collectors, or other chief officers of the Customs, and of the inspectors aforesaid within the said several districts, to enforce the provisions of law against all steamers arriving and departing; and upon proof that any collector, or other chief officer of the Customs, or inspector, has negligently or intentionally omitted his duty in this particular, such delinquent shall be liable to removal from office, and to a penalty of one hundred dollars for each offence, to be sued for in an action of debt before any court of competent jurisdiction.

Original certificates of inspectors to be retained on file.

Certified copies to be given to master, and where placed.

Penalty for not having copies so certified and kept.

For carrying gunpowder without authority.

Sect. 31. And be it further enacted, That every collector or other chief officer of the Customs shall retain on file all original certificates of the inspectors required by this Act to be delivered to him, and shall give to the master or owner of the vessel therein named three certified copies thereof, two of which shall be placed by such master or owner in conspicuous places in the vessel where they will be most likely to be observed by passengers and others, and there kept at all times, framed under glass; the other shall be retained by such master or owner as evidence of the authority thereby conferred; and if any passenger shall be received on board any steamer not having the certified copies of the certificate of approval as required by this Act, placed and kept as aforesaid, or if any passenger steamer shall receive or carry any gunpowder on board, not having a certificate authorising the same, and a certified copy thereof placed and kept as aforesaid, or shall carry any gunpowder at a place or in a manner not authorised by such certificate, such steamer shall be held liable for a penalty of one hundred dollars for each offence, to be recovered in any court of competent jurisdiction.

Upon inspector for wilfully certifying falsely.

Sect. 32. And be it further enacted, That every inspector who shall wilfully certify falsely touching any vessel propelled in whole or in part by steam, as to her hull, accommodations, boilers, engines, machinery, or their appurtenances, or any of her equipments, or any matter or thing contained in any certificate signed and sworn to by him, shall, on conviction thereof, be punished by fine not exceeding five hundred dollars, or imprisonment not exceeding six months, or both.

Who may not be supervising or local inspectors.

Penalty for such persons attempting to exercise the functions of steamboat inspector.

Sect. 33. And be it further enacted, That no person interested, either directly or indirectly, in any patented life-preserver, life-boat, gauge, or any article required to be used on any steamer by this Act, or who is a member of any association of owners, masters, engineers, or pilots of steamboats, or who is directly or indirectly pecuniarily interested in any steam vessel, or who has not the qualifications and acquirements as prescribed by this Act, or who is intemperate in his habits, shall be eligible to hold the office of either supervising or local inspector, or discharge the duties thereof; and if any such person shall attempt to exercise the functions of the office of steamboat inspector, it shall be a misdemeanor, for which he shall be subject to a penalty of five hundred dollars, and shall be dismissed from office.

Upon inspector for receiving illegal fees, &c., for services.

Sect. 34. And be it further enacted, That any inspector who shall, upon any pretence, receive any fee or reward for his service rendered under this Act, except what is herein allowed him, shall forfeit his office, and if found guilty, on indictment or otherwise, be punished, according to the aggravation of the offence, by fine not exceeding five hundred dollars, or imprisonment not exceeding six months, or both.

Boilers manufactured after twelve months, &c., how to be constructed.

Sect. 35. And be it further enacted, That every boiler manufactured after twelve months from the passage of this Act, to be used on steam-vessels, and made of iron or steel plates, shall be constructed of plates that have been stamped in

n accordance with the provision of this Act; and if any person shall construct a boiler, or steampipe connecting the boilers, to be so used, of iron or steel plates which have not been stamped and inspected according to the provisions of this Act, or otherwise as herein provided, or who shall knowingly use any defective, bad, or faulty iron or steel in the construction of such boilers; or shall drift any rivet-hole to make it come fair; or shall deliver any such boiler for use, knowing it to be imperfect in its flues, flanging, riveting, bracing, or in any other of its parts, shall be fined one thousand dollars, one-half for the use of the informer: Provided, however, That nothing in this Act shall be so construed as to prevent from being used, on any steamer, any boiler or steam-generator which may not be constructed of riveted iron or steel plates, when the Board of Supervising Inspectors shall have satisfactory evidence that such boiler or steam-generator is equal in strength, and as safe from explosion, as a boiler of the best quality, constructed of riveted iron or steel plates.

Penalty for doing otherwise.

Boilers, &c., not so constructed may be used, if, &c.

Sect. 36. And be it further enacted, That after twelve months from the passage of this Act, every iron or steel plate used in the construction of steamboat boilers, and which shall be subject to a tensile strain, shall be inspected in such manner as shall be prescribed by the Board of Supervising Inspectors and approved by the Secretary of the Treasury, so as to enable the inspectors to ascertain its tensile strength, homogeneousness, toughness, and ability to withstand the effect of repeated heating and cooling; and no iron or steel plate shall be used in the construction of such boilers which has not been so inspected and approved under the rules prescribed as aforesaid.

Inspection of iron or steel plates used in the construction of boilers.

Such plates not to be used unless inspected.

Sect. 37. And be it further enacted, That every such plate of boiler iron or steel, made for use in the construction of steamboat boilers, shall be distinctly and permanently stamped by the manufacturer thereof, and, if practicable, in such places that the marks shall be left visible when such plates shall be worked into boilers, with the name of the manufacturer, the place where manufactured, and the number of pounds tensile strain it will bear to the sectional square inch; and the inspectors shall keep a record in their office of the stamps upon all boiler plates and boilers made under the provisions of this Act, which they shall inspect.

To be stamped by the manufacturer, &c.

Record of stamps on boiler plates and boilers.

Sect. 38. And be it further enacted, That if any person shall counterfeit, or cause to be counterfeited, any of the marks or stamps required by this Act, or shall designedly stamp or cause to be stamped falsely any boiler iron or steel plates, or if any person shall stamp or mark, or cause to be stamped or marked, any such iron or steel plates with the name or trade-mark of another with the intent to mislead or deceive, any such person or persons shall, upon conviction thereof, be fined two thousand dollars, one-half to the use of the informer, and may, in addition thereto, at the discretion of the court, be imprisoned not exceeding two years.

Penalty for counterfeiting stamps, or wilfully stamping falsely boiler iron or steel plates, &c.

Sect. 39. And be it further enacted, That after one year from the passage of this Act, no iron or steel plates shall be used in the construction of boilers for steam-vessels unless they have been inspected in accordance with the provisions of this Act; and the working steam pressure allowable on such boilers when single-riveted shall not produce a strain to exceed one-sixth of the tensile strength of the iron or steel plates of which such boilers are constructed; but where the longitudinal laps of the cylindrical parts of such boilers are double-riveted, and the rivet-holes for such boilers have been fairly drilled instead of punched, an addition of twenty per centum to the working pressure provided for single-riveting may be allowed: Provided, That all other parts of said boilers shall correspond in strength to the additional allowances so made; and no split calking shall in any case be permitted. And every such boiler shall be provided with a good, well-constructed safety-valve or valves, of such number, dimensions, and arrangements as shall be prescribed by the Board of Supervising Inspectors, and shall also be provided with a sufficient number of gauge-cocks, and a reliable low-water indicator that will give alarm when the water falls below its prescribed limits; and in addition thereto there shall be inserted, in a suitable manner, in the flues, crown sheet, or other parts of the boiler most exposed to the heat of the furnace when the water falls below its prescribed limits, a plug of good Banca tin, and no boiler to which the heat is applied to the outside of the shell thereof shall be constructed of iron or steel plates of more than twenty-six one-hundredths of

After one year no plates to be used in the construction of boilers unless inspected, &c.

Working steam pressure allowable.

Proviso.

Safety-valves.

Gauge-cocks and low-water indicator.

Plug of Banca tin.

Thickness of boiler plates.

of an inch in thickness, the ends or heads of the boilers only excepted, and every such boiler employed on steamers navigating rivers flowing into the Gulf of Mexico, or their tributaries, shall have not less than three inches space between and around its internal flues; and the feed-water shall be delivered into the boilers in such manner as to prevent it from contracting the metal, or otherwise injuring the boilers. And when boilers are so arranged on a steamer that there is employed a water-connecting pipe through which the water may pass from one boiler to another, there shall also be provided a similar steam connection, having an area of opening into each boiler of at least one square inch for every two square feet of effective heating surface contained in any one of the boilers so connected, half the flue and all other fire surfaces being computed as effective. And adequate provision shall be made on all steamers to prevent sparks or flames from being driven back from the fire doors into the vessel.

Water and steam connecting pipes.

Sparks or flames.

Penalty for intentionally obstructing safety-valves, &c.

Sect. 40. And be it further enacted, That if any person shall intentionally load or obstruct, or cause to be loaded or obstructed, in any way or manner, the safety-valve of a boiler, or shall employ any other means or device whereby the boiler may be subjected to a greater pressure than the amount allowed by the certificate of the inspectors, or shall intentionally derange or hinder the operation of any machinery or device employed to denote the state of the water or steam in any boiler, or to give warning of approaching danger, or shall intentionally permit the water to fall below the prescribed low-water line of the boiler, it shall, in any such case, be a misdemeanor, and any and every person concerned therein, directly or indirectly, shall forfeit two hundred dollars, and may, at the discretion of the court, be, in addition thereto, imprisoned not exceeding five years.

Or permitting water to fall below low-water line of the boiler.

What steamers subject to this Act.

Sect. 41. And be it further enacted, That all steamers navigating the lakes, bays, inlets, sounds, rivers, harbours, or other navigable waters of the United States, when such waters are common highways of commerce, or open to general or competitive navigation, shall be subject to the provisions of this Act: Provided, That this Act shall not apply to public vessels of the United States or vessels of other countries, nor to boats, propelled in whole or in part by steam, for navigating canals.

What not.

River steamers, if pilot, or engineer, deem navigation unsafe, to be brought to anchor, &c.

Sect. 42. And be it further enacted, That on any steamers navigating rivers only, when, from darkness, fog, or other cause, the pilot or watch shall be of opinion that the navigation is unsafe, or from accident to or derangement of the machinery of the boat, the chief engineer shall be of the opinion that the further navigation of the vessel is unsafe, the vessel shall be brought to anchor or moored as soon as it can prudently be done: Provided, That if the person in command shall, after being so admonished by either of such officers, elect to pursue such voyage, he may do the same; but in such case both he and the owners of such steamer shall be answerable for all damages which shall arise to the person of any passenger or his baggage from said causes in so pursuing the voyage, and no degree of care or diligence shall in such case be held to justify or excuse the person in command or said owners.

If master after, &c., pursues the voyage, he and owners are responsible for damages.

No care to excuse.

Master and owner liable to passengers for what damages.

Sect. 43. And be it further enacted, That whenever damage is sustained by any passenger or his baggage from explosion, fire, collision, or other cause, the master and the owner of such vessel, or either of them, and the vessel, shall be liable to each and every person so injured to the full amount of damage, if it happens through any neglect or failure to comply with the provisions of law herein prescribed, or through known defects or imperfections of the steaming apparatus or of the hull, and any person sustaining loss or injury through the carelessness, negligence, or wilful misconduct of any captain, mate, engineer, or pilot, or his neglect or refusal to obey the provisions of law herein prescribed as to navigating such steamers, may sue such captain, mate, engineer, or pilot, and recover damages for any such injury caused as aforesaid by any such captain, mate, engineer, or pilot.

Steamboats to have name painted on stern and outside of pilot or wheel-house on each side.

Penalty.

Sect. 44. And be it further enacted, That every steamboat of the United States shall, in addition to having her name painted on her stern, as now required by law, also have the same conspicuously placed in distinct, plain letters, of not less than six inches in length, on each outer side of the pilot-house, if it has such, and (in case the said boat has side-wheels) also on the outer side of each wheel-house;

house; and if any such steamboat shall be found without having her name placed as herein required, she shall be subject to the same penalty and forfeiture as is now provided by law in the case of a vessel of the United States found without having her name and the name of the port to which she belongs painted on her stern as required by law.

Name of vessel not to be changed, &c.

Sect. 45. And be it further enacted, That no master, owner, or agent of any vessel of the United States shall in any way change the name of such vessel, or by any device, advertisement, or contrivance, deceive, or attempt to deceive, the public or any officer or agent of the United States Government, or of any State, or any corporation or agent thereof, or any person or persons, as to the true name or character of such vessel, on pain of the forfeiture of such vessel.

Barges carrying passengers, in tow of a steamer, subject to this Act.

Penalty.

Sect. 46. And be it further enacted, That every barge carrying passengers while in tow of any steamer shall be subject to the provisions of this Act for the preservation of the lives of passengers so far as relates to fire-buckets, axes, life-preservers, and yawls to such an extent as shall be prescribed by the Board of Supervising Inspectors; for the violation of this section the penalty shall be two hundred dollars, one-half for the use of the informer.

River steamers on waters flowing into the Gulf of Mexico to carry what lights.

Boats moored, &c., in or near the channel, &c., of any bay, &c., to show what lights between sunset and sunrise.

Fog horns or signals.

Coasting and lake steamers to carry what lights.

Ferry-boats.

Foremast head light for steamships.

1864, ch. 69, vol. xiii, p. 58.

Sect. 47. And be it further enacted, That every river steamer navigating waters flowing into the Gulf of Mexico, and their tributaries, shall carry the following lights, viz.: One red light on the outboard side of the port smoke-pipe, and one green light on the outboard side of the starboard smoke-pipe; these lights to show both forward and abeam on their respective sides. And upon each and every coal-boat, trading-boat, produce-boat, canal-boat, oyster-boat, fishing-boat, raft, or other water-craft, navigating any bay, harbour, or river, by hand-power, horse-power, sail, or by the current of the river, or which shall be anchored or moored in or near the channel or fairway of any bay, harbour, or river, there shall be carried, from sunset to sunrise, one or more good white lights, which shall be placed in such manner as shall be prescribed by the Board of Supervising Inspectors; and every such vessel or raft, when running in a fog or thick weather, or shall be anchored or moored in or near the channel or fairway as aforesaid, and not in any port, shall sound a fog-horn, or equivalent signal, at intervals of not more than two minutes, which shall make a sound equal to a steam-whistle; and all steamers navigating in a fog or thick weather shall sound their steam-whistles at intervals of not more than one minute. Every coasting steamer, and every steamer navigating bays, lakes, or other inland waters, other than ferry-boats and those above provided for, shall carry the red and green lights as provided for ocean-going steamers, and, in addition thereto, a central range of two white lights; the after-light being carried at an elevation of at least fifteen feet above the light at the head of the vessel, the head-light to be so constructed as to show a good light through twenty points of the compass, namely, from right ahead to two points abaft the beam on either side of the vessel, and the after-light to show all around the horizon; the lights for ferry-boats shall be regulated by such rules as the Board of Supervising Inspectors shall prescribe; and that the provision for a foremast head-light for steamships, in an Act entitled, "An Act fixing certain Rules and Regulations for Preventing Collisions on the Water," approved the twenty-ninth day of April eighteen hundred and sixty-four, shall not be construed to apply to other than ocean-going steamers and steamers carrying sail.

Certificate of inspection to state number of passengers steamer can safely carry.

Penalty for carrying a larger number.

Special permits for excursions.

Sect. 48. And be it further enacted, That the inspectors shall state in every certificate of inspection granted to steamers carrying passengers, other than ferry-boats, the number of passengers of each class that any such steamer has accommodations for, and can carry with prudence and safety; and it shall not be lawful to take on board of any such steamer a greater number of passengers than is so stated in the certificate as aforesaid; and for every violation of this provision the master and owner, or either of them, shall be liable, to any persons suing for the same, to forfeit the amount of passage-money and ten dollars for each passenger beyond the number thus allowed: Provided, however, That if any such steamer shall engage in excursions, inspectors shall issue to such steamer a special permit, in writing, for the occasion, in which shall be stated the additional number of passengers that may be carried, and the number and kind of life-saving appliances that shall be provided for the safety of such additional

passengers; and they shall also, in their discretion, limit the route and distance for such excursions.

Masters of passenger steamers to keep correct passenger lists.

Sect. 49. And be it further enacted, That it shall be the duty of the master of every passenger steamer to keep a correct list of all the passengers received and delivered from day to day, noting the places where received and where landed, which record shall be open to the inspection of the inspectors and officers of the customs at all times, and the aggregate number of said passengers shall be furnished to inspectors as often as called for; but on routes not exceeding one hundred miles, the number of passengers, if kept, shall be sufficient; and in case of default through negligence or design, the said master shall forfeit one hundred dollars, which penalty, as well as that for excess of passengers, shall be a lien upon the vessel: Provided, however, That a bond may, as provided in other cases, be given to secure the satisfaction of the judgment.

Penalty for intentional default.

Lien on vessel.

Bond may be given.

Two copies of this Act to be kept on board each steamer.

Penalty on master, &c., for not so doing.

Sect. 50. And be it further enacted, That every master or commander of any steamer carrying passengers shall keep on board of such steamer at least two copies of this Act, to be furnished to him by the Secretary of the Treasury; and if the master or commander neglects or refuses to do so, or shall unreasonably refuse to exhibit a copy of the same to any passenger who shall ask for it, he shall forfeit twenty dollars.

What vessels subject to the navigation laws of the United States.

Rules, &c., for steam-vessels in passing.

Sect. 51. And be it further enacted, That all coastwise sea-going vessels, and vessels navigating the great lakes, shall be subject to the navigation laws of the United States, when navigating within the jurisdiction thereof; and all vessels, propelled in whole or in part by steam, and navigating as aforesaid, shall be subject to all the rules and regulations established in pursuance of law for the government of steam-vessels in passing, as provided by this Act; and every coastwise sea-going steam-vessel subject to the navigation laws of the United States, and to the rules and regulations aforesaid, not sailing under register, shall, when under way, except on the high seas, be under the control and direction of pilots licensed by the inspectors of steam-boats. And no State or municipal government shall impose upon pilots of steam-vessels herein provided for any obligation to procure a State or other license in addition to that issued by the United States, nor other regulation which will impede such pilots in the performance of their duties, as required by this Act; nor shall any pilot charges be levied by any such authority upon any steamer piloted as herein provided, and in no case shall the fees charged for the pilotage of any steam-vessel exceed the customary or legally established rates in the State where the same is performed: Provided, however, That nothing in this Act shall be construed to annul or affect any regulation established by the laws of any State requiring vessels entering or leaving a port in any such State, other than coastwise steam-vessels, to take a pilot duly licensed, or authorized by the laws of such State, or of a State situate upon the waters of such State.

Pilots licensed by inspectors of steam-boats to have the control of certain vessels and where.

Not to be required to procure other license.

Pilot charges.

Certain State regulations not affected.

Lifeboats, floats, drags, &c.

Boat-disengaging apparatus.

Sect. 52. And be it further enacted, That every steamer navigating the ocean, or any lake, bay, or sound of the United States, shall be provided with such numbers of life-boats, floats, rafts, life-preservers, and drags, as will best secure the safety of all persons on board such vessel in case of disaster; and every sea-going vessel carrying passengers, and every such vessel navigating any of the northern or north-western lakes, shall have the life-boats required by law, provided with suitable boat-disengaging apparatus, so arranged as to allow such boats to be safely launched while such vessels are under speed or otherwise, and so as to allow such disengaging-apparatus to be operated by one person, disengaging both ends of the boat simultaneously from the tackles by which it may be lowered to the water. And it shall be the duty of the Board of Supervising Inspectors to fix and determine, by their rules and regulations, the kind of life-boats, floats, rafts, life-preservers, and drags that shall be used on such vessels, and also the kind and capacity of pumps or other appliances for freeing the steamer from water in case of heavy leakage, the capacity of said pumps or appliances being suited to the navigation in which the steamer is employed; and if the owners of any such steamers neglect or refuse to provided such drags, life-boats, floats, rafts, life-preservers, pumps, or appliances, as shall be required by the Board of Supervising Inspectors, and approved by the Secretary of the Treasury, such owners shall be fined one thousand dollars.

Board of supervising inspectors to fix by rules the kind of life-boats, &c.

Penalty upon owners for neglect to provide such.

Sect. 53.

Sect. 53. And be it further enacted, That every sea-going steamer, and every steamer navigating the great northern or north-western lakes, carrying passengers, the building of which shall be completed after six months from the passage of this Act, shall have not less than three water-tight cross-bulkheads, said bulkheads to reach to the main deck in single-decked vessels, otherwise to the deck next below the main deck; the same to be made of iron plates, sustained upon suitable framework, and properly secured to the hull of the vessel; the position of such bulkheads and the strength of material of which the same shall be constructed to be determined by the general rules of the Board of Supervising Inspectors.

Certain steamers built after, &c., to have water-tight cross-bulkheads.

Mode of construction.

Sect. 54. And be it further enacted, That it shall at all times be the duty of all officers licensed under the provisions of this Act to assist the inspectors in their examination of any such vessel to which any such licensed officers belong, and to point out all defects and imperfections known to them in the hull, equipments, boilers, or machinery of such vessel, and also to make known to the inspectors, at the earliest opportunity, all accidents or occurrences producing serious injury to the vessel, her boilers, or machinery; and in default thereof the license of any such officer so neglecting or refusing shall be revoked.

Licensed officers to assist inspectors in examinations and point out defects, &c.

Penalty for default.

Sect. 55. And be it further enacted, That if any licensed officer shall, to the hinderance of commerce, wrongfully or unreasonably refuse to serve in his official capacity on any steamer, as authorized by the terms of his certificate of license, or shall fail to deliver to the applicant for such service at the time of such refusal, if the same shall be demanded, a statement in writing assigning good and sufficient reasons therefor, or if any pilot or engineer shall refuse to admit into the pilot-house or engine-room any person whom the master or owner of the vessel may desire to place there for the purpose of learning the profession, his license shall be revoked upon the same proceedings as herein provided in other cases of revocation of such licenses.

Penalty upon licensed officer for wrongfully refusing to serve on any steamer, &c.

Upon pilot or engineer for refusing to admit into pilot-house, &c., certain persons.

Sect. 56. And be it further enacted, That every captain, chief mate, engineer, and pilot of any such vessel shall, before entering upon his duties, make solemn oath before one of the inspectors herein provided for, to be recorded with the certificate, that he will faithfully and honestly, according to his best skill and judgment, without concealment or reservation, perform all the duties required of him by this Act. And if any such captain, chief mate, engineer, or pilot, or any person summoned under this Act as a witness, shall, when under examination on oath by any such inspector, knowingly and intentionally falsify the truth, such person shall be deemed guilty of perjury, and if convicted be punished accordingly: Provided, however, That when any such licensed officer is employed on a steamer in a district distant from any local board of inspectors, such inspectors, or the supervising inspector of the district, may grant a renewal of his license without such licensed officer being personally present, under such regulations as the Board of Supervising Inspectors shall prescribe.

Officers to make oath to perform duty required by this Act.

Penalty for giving false testimony.

Renewal of license.

Sect. 57. And be it further enacted, That any captain, engineer, or pilot, or other person employed on any steamboat or vessel, by whose misconduct, negligence, or inattention to his or their respective duties on such vessel, the life of any person shall be destroyed, or if in consequence of fraud, connivance, misconduct, or violation of law by any owner or inspector, or other public officer, the life of any person shall be destroyed, he or they shall be deemed guilty of manslaughter, and, upon conviction thereof before any circuit court of the United States, shall be sentenced to confinement at hard labour for a period of not more than ten years.

Captains and other officers, by whose misconduct, &c., the life of any person has been lost, shall be deemed guilty of manslaughter.

Penalty.

Sect. 58. And be it further enacted, That the hull and boilers of every ferry-boat, yacht, canal-boat, or other small craft of like character, propelled by steam, shall be inspected under the provisions of this Act. And such other provisions of law for the better security of life, as may be applicable to such vessels, shall, by the rules and regulations of the Board of Supervising Inspectors, be required before a certificate of inspection shall be granted; and no such vessel shall be navigated without a licensed engineer and a licensed pilot.

Hulls and boilers of ferry-boats, &c., to be inspected.

Rules, &c., for the better security of life thereon.

To have licensed engineer and pilot.

Sect. 59. And be it further enacted, That the hull and boiler or boilers of every tug-boat, towing-boat, and freight-boat shall be inspected, under the provi-

Hulls and boilers of tug-boats to be inspected, &c.

sions of this Act; and it shall be the duty of the inspectors to see that the boilers, machinery, and appurtenances of such vessels are not dangerous in form or workmanship, and that the safety-valves, gauge-cocks, low-water alarm-indicators, steam-gauges, and fusible plugs are all attached in conformity to law; and the officers navigating such vessels shall be licensed in conformity with the provisions of this Act, and shall be subject to the same regulation of law as officers navigating passenger steamers.

Officers of tug-boats, &c., to be licensed, &c.

Fees for issuing licenses to steamers.

Sect. 60. And be it further enacted, That, before issuing any license to any steamer, the collector or other chief officer of the customs for the port or district shall demand and receive from the owner or owners thereof, as a compensation for the inspections and examination made for the year, the following sums, in addition to the fees for issuing enrolments and licenses now allowed by law, according to the tonnage of the vessel, to wit: For each steam-vessel of one hundred tons or under, twenty-five dollars; and, in addition thereto, for each and every ton in excess of one hundred tons, five cents. And each captain, chief engineer, and first-class pilot, licensed as herein provided, shall pay for every certificate, granted by any inspector or inspectors, the sum of ten dollars; and every chief mate, engineer, and pilot of an inferior grade shall pay, for every certificate so granted, the sum of five dollars, which shall be paid over to the chief officer of the customs in such manner and under such regulations as shall be prescribed by the Secretary of the Treasury.

To captains, engineers, pilots, &c.

Report of local inspectors to supervising inspector.

Sect. 61. And be it further enacted, That each local board of inspectors shall keep an accurate account of every such steamer boarded by them during the year, and of all their official acts and doings, which, in the form of a report, they shall communicate to the supervising inspector of the district, at such times as the Board of Supervising Inspectors, by their established rules, shall direct.

Local board of inspectors in district of Puget Sound, Milwaukee, Albany, Apalachicola, Evansville, Huron, Marquette.

Pay of local inspectors.

Sect. 62. And be it further enacted, That in addition to the local boards of inspectors now appointed by law, there shall be a local board designated and appointed for the district of Puget Sound, Washington Territory; for the district of Milwaukee, Wisconsin; for the district of Albany, New York; for the district of Apalachicola, Florida; for the district of Evansville, Indiana; and for the district of Huron, Michigan; and also at Marquette, in the district of Superior. And each local inspector of the several districts, respectively, shall be paid annually, under the direction of the Secretary of the Treasury, the following compensation, to wit: One inspector of hulls, and one inspector of boilers, for the districts of New York and New Orleans, two thousand two hundred dollars each; for the districts of Philadelphia, Baltimore, Buffalo, St. Louis, Louisville, Cincinnati, Pittsburg, San Francisco, Boston, Detroit, Chicago, Milwaukee, Huron, and Galena, two thousand dollars each; for the districts of Mobile, Memphis, and Cleveland, one thousand five hundred dollars each; for Portland, in the district of Oregon, New London, Norfolk, Charleston, Savannah, Galveston, Albany, Wheeling, Nashville, Portland, Maine, and Evansville, one thousand two hundred dollars each; for the districts of Puget Sound, Apalachicola, Oswego, and Burlington, and also at Marquette, eight hundred dollars each; and, in addition thereto, the Secretary of the Treasury may appoint, in such districts where their services are actually required, assistant inspectors, at a compensation, for the district of New York, two thousand dollars; and all other districts, not exceeding sixteen hundred dollars per annum to each person so appointed; or may appoint a clerk to any such board at a compensation not exceeding twelve hundred dollars per annum to each person so appointed. And each supervising inspector shall be paid three thousand dollars per annum; and every inspector shall be paid for his actual, reasonable travelling expenses, at the rate of ten cents per mile, when incurred in the performance of his duty; and also for transportation of instruments, which shall be certified and sworn to under such instructions as shall be given by the Secretary of the Treasury.

Assistant inspectors and clerks authorised, their appointment, pay, &c.

Salary of supervising inspectors.

Travel, and transportation of instruments.

Supervising inspector general authorised.

Appointment, duties, pay, &c.

Sect. 63. And be it further enacted, That the President of the United States shall, by and with the advice and consent of the Senate, appoint a supervising inspector general, who shall be selected with reference to his fitness and ability to systematize and carry into effect all the provisions of law relating to the steamboat inspection service, whose duty it shall be, under the direction of the Secretary of the Treasury, to superintend the administration of the steamboat inspection

inspection laws, preside at the meetings of the board of supervising inspectors, receive all reports of inspectors, and receive and examine all accounts of such officers, report fully at stated periods to the Secretary of the Treasury upon all matters pertaining to his official duties, and produce a correct and uniform administration of the inspection laws, rules, and regulations; and the said supervising inspector general shall be paid for his services at the rate of three thousand five hundred dollars per annum, and all his reasonable travelling expenses, or mileage, at the rate of ten cents per mile when on official duty.

Secretary of the Treasury may remit the penalties, &c., under this Act, except, &c., or may discontinue prosecutions.

Sect. 64. And be it further enacted, That the Secretary of the Treasury may, upon application, therefor, remit or mitigate any fine or penalty provided for in this Act, or discontinue any prosecution to recover penalties denounced in this Act excepting the penalty of imprisonment or of removal from office, upon such terms as he, in his discretion, shall think proper; and that all rights granted to informers by this Act shall be held subject to the said Secretary's power of remission, except in cases where the claims of any informer to the share of any penalty shall have been determined by a court of competent jurisdiction prior to the application for the remission of said penalty; and that the said Secretary shall have authority to ascertain the facts upon all such applications, in such manner and under such regulations as he may deem proper.

Rights of informers.

Facts to be ascertained.

Instruments, stationery, printing, &c., for local boards.

Sect. 65. And be it further enacted, That the Secretary of the Treasury shall procure for the several supervising inspectors and local boards of inspectors such instruments, stationery, printing, and other things necessary for the use of their respective offices as may be required therefor; and shall make such rules and regulations as may be necessary to secure the proper execution of the steamboat Acts.

Salaries and other expenses of inspectors to be paid out of the revenues received from inspection of vessels, licensing of officers, &c.

Sect. 66. And be it further enacted, That the salaries of all supervising inspectors, local inspectors, assistant inspectors, supervising inspector general, and clerks, herein provided for, together with their travelling and other expenses when on official duty, and all instruments, books, blanks, stationery, furniture, and other things necessary to carry into effect the provisions of this Act, shall be paid for under the direction of the Secretary of the Treasury, out of the revenues received into the Treasury from the inspection of steam vessels, and the licensing of the officers of such vessels, as provided for by the terms of this Act; and the same is hereby appropriated for the payment of such expenses, or so much thereof as may be required for such purposes.

Appropriation.

Bonds of supervising and local inspectors.

Sect. 67. And be it further enacted, That supervising and local inspectors of steamboats shall execute proper bonds, in such form and upon such conditions as the Secretary of the Treasury may prescribe, and subject to his approval, conditioned for the faithful performance of the duties of their respective offices, and the payment in the manner provided by law of all moneys that may be received by them.

Penalty under this Act in cases not otherwise provided for.

Sect. 68. And be it further enacted, That the penalty for the violation of any provision of this Act that is not otherwise specially provided for shall be a fine of five hundred dollars, one-half for the use of the informer.

Masters and owners of vessels not liable as carriers for loss of certain goods in certain cases.

Sect. 69. And be it further enacted, That if any shipper or shippers of platina, gold, gold dust, silver, bullion, or other precious metals, coins, jewellery, bills of any bank or public body, diamonds or other precious stones, or any gold or silver in a manufactured or unmanufactured state, watches, clocks, or timepieces of any description, trinkets, orders, notes, or securities for payment of money, stamps, maps, writings, title deeds, printings, engravings, pictures, gold or silver plate or plated articles, glass, china, silks in a manufactured or unmanufactured state, and whether wrought up or not wrought up with any other material, furs, or lace, or any of them, contained in any parcel, or package or trunk, shall lade the same as freight or baggage, on any boat or vessel, without at the time of such lading giving to the master, clerk, agent, or owner of such boat or vessel receiving the same a written notice of the true character and value thereof, and having the same entered on the bill of lading therefor, the master and owner or owners of said boat or vessel shall not be liable as carriers thereof in any form or manner; nor shall any such master, owner or owners be liable for any such goods beyond the value and according to the character thereof so notified and entered.

Limit to liability.

Signal-lights of sailing vessels.

1864, ch. 69, vol. xiii, p. 58.

Penalty.

Sect. 70. And be it further enacted, That it shall be the duty of all collectors or other chief officers of the customs, to require all sailing vessels to be furnished with proper signal lights, as provided for by the Act of twenty-ninth April eighteen hundred and sixty-four, entitled, "An Act fixing certain rules and regulations for preventing collisions on the water," and every such vessel shall, on the approach of any steamer during the night time, show a lighted torch upon that point or quarter to which such steamer shall be approaching. And every such vessel that shall be navigated without complying with the terms of the said Act of twenty-ninth April eighteen hundred and sixty-four, and the provisions of this section, shall forfeit and pay the sum of two hundred dollars, one half to go to the informer; and for which sum the vessel so navigated shall be liable, and may be seized and proceeded against by way of libel, in any district court of the United States having jurisdiction of the offence.

Repeal of—

1838, ch. 191, vol. v, p. 304.

1843, ch. 94, vol. v, p. 626.

1852, ch. 106, vol. x, p. 61.

1864, ch. 78, vol. xiii, p. 63.

1864, ch. 113, vol. xiii, p. 120.

1865, ch. 94, vol. xiii, p. 514.

1866, ch. 234, vol. xiv, p. 227.

Sect. 71. And be it further enacted, That the Act entitled "An Act to provide for the better security of the lives of passengers on board vessels propelled in whole or in part by steam," approved seventh July eighteen hundred and thirty-eight; also, "An Act to modify the Act entitled 'An Act to provide for the better security of the lives of passengers on board of vessels propelled in whole or in part by steam,' approved seventh July eighteen hundred and thirty-eight," approved third March eighteen hundred and forty-three; also, "An Act to amend an Act entitled, 'An Act to provide for the better security of the lives of passengers on board of vessels propelled in whole or in part by steam,' and for other purposes," approved thirtieth August eighteen hundred and fifty-two; also, "An Act for the prevention and punishment of frauds in relation to the names of vessels," approved fifth May eighteen hundred and sixty-four; also, "An Act to create an additional supervising inspector of steamboats, and two local inspectors of steamboats for the collection district of Memphis, Tennessee, and two local inspectors for the collection district of Oregon, and for other purposes," approved eight June eighteen hundred and sixty-four; also, "An Act to provide for two assistant local inspectors of steamboats in the city of New York, and for two local inspectors at Galena, Illinois, and to re-establish the board of local inspectors at Wheeling; and also to amend the Act approved eight June eighteen hundred and sixty-four, entitled, 'An Act to create an additional supervising inspector of steamboats, and two local inspectors of steamboats for collection districts of Memphis and Oregon, and for other purposes,'" approved third March eighteen hundred and sixty-five; also, "An Act further to provide for the safety of the lives of passengers on board of vessels propelled in whole or in part by steam, to regulate the salaries of steamboat inspectors, and for other purposes," approved twenty-fifth July eighteen hundred and sixty-six, are all and severally hereby repealed; also, all other Acts and parts of Acts inconsistent with this Act are hereby repealed.

AN ACT to establish a Board of Local Inspectors of Steam Vessels for the Customs District of Michigan, in the State of Michigan.

Local board at Grand Haven, Michigan, established.

BE it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That there shall be a local board of inspectors designated and appointed for the customs district of Michigan, in the State of Michigan, and the inspector of hulls, and the inspector of boilers, composing the said board shall receive a salary of nine hundred dollars a year each.

Approved, 3 March 1873.

GENERAL RULES and REGULATIONS prescribed by the BOARD of SUPERVISING INSPECTORS of STEAM VESSELS, in pursuance of the Act of Congress approved 28th February 1871.

Diameter of Boiler.	Thickness of Plates.	45,000 Tensile Strain. ⅙ Tensile Strain, 7,500.		50,000 Tensile Strain. ⅙ Tensile Strain, 8,333·3.		55,000 Tensile Strain. ⅙ Tensile Strain, 9,166·6.		60,000 Tensile Strain. ⅙ Tensile Strain, 10,000.		65,000 Tensile Strain. ⅙ Tensile Strain, 10,833·3.		70,000 Tensile Strain. ⅙ Tensile Strain, 11,666·6.	
		Pressure.	20 per Cent. additional.	Pressure.	20 per Cent. additional.	Pressure.	20 per Cent. additional.	Pressure.	20 per Cent. additional.	Pressure.	20 per Cent. additional.	Pressure.	20 per Cent. additional.
36 inches.	·1875	78·12	93·74	86·8	104·16	95·48	114·57	104·16	124·99	112·84	135·4	121·52	145·82
	·21	87·5	105·	97·21	116·66	106·93	128·31	116·66	139·99	126·38	151·65	136·1	163·83
	·23	95·83	114·99	106·47	127·77	117·12	140·54	127·77	153·32	138·41	166·	149·	178·8
	·25	104·16	124·99	115·74	138·88	127·31	152·77	138·88	166·66	150·4	180·48	164·25	197·1
	·26	108·33	129·99	120·37	144·44	132·4	158·88	144·44	173·32	156·45	187·74	168·5	202·2
	·29	120·83	144·99	134·26	161·11	147·68	177·21	161·11	193·33	174·5	209·4	187·86	225·43
	·3125	130·2	156·24	144·67	173·6	159·14	190·96	173·6	208·33	188·	225·6	202·5	243·
	·33	137·5	165·	152·77	183·33	168·	201·6	183·33	219·99	193·	231·6	213·88	256·65
	·35	145·83	175·	162·	194·44	178·23	213·87	194·44	233·32	210·64	252·76	226·84	272·20
	·375	156·25	187·5	173·61	208·33	190·96	229·15	208·33	249·96	225·6	271·	243·	291·6
38 inches.	·1875	74·	88·8	82·23	98·68	90·46	108·55	98·68	118·41	106·9	128·28	116·	139·2
	·21	82·89	99·46	92·1	110·52	101·31	121·57	110·5	132·6	119·73	143·67	128·93	154·71
	·23	90·78	108·93	100·87	121·	110·96	133·15	121·	145·2	131·13	157·35	141·22	169·46
	·25	98·6	118·32	109·64	131·56	120·61	144·73	131·57	157·88	142·54	171·	153·5	184·2
	·26	102·6	123·12	114·	136·84	125·43	150·51	136·84	164·2	148·24	177·88	159·64	191·56
	·29	114·47	137·36	127·19	152·63	139·91	167·89	152·63	183·15	165·35	198·42	178·6	214·32
	·3125	123·35	148·	137·	164·47	150·76	180·91	164·47	197·3	178·17	213·84	191·87	230·25
	·33	130·26	156·31	144·73	173·67	159·2	191·	173·67	213·32	188·16	225·79	202·62	243·14
	·35	138·15	165·78	153·5	184·21	168·85	202·62	184·21	221·	199·55	239·46	214·91	257·89
	·375	148·	177·6	164·4	197·36	180·91	217·	197·36	237·	213·84	256·6	230·25	276·3
40 inches.	·1875	70·31	84·37	78·12	93·74	85·93	103·11	93·74	112·5	101·55	121·86	109·36	131·23
	·21	78·75	94·50	87·45	105·	96·24	115·48	105·	126·	113·74	136·48	122·45	146·94
	·23	86·25	103·5	95·83	115·	105·41	126·49	115·	138·	124·58	149·49	134·16	160·99
	·25	93·7	112·44	104·16	125·	114·58	137·49	125·	150·	135·4	162·48	145·8	174·96
	·26	97·5	117·	108·33	130·	119·16	142·99	130·	156·	140·82	168·98	151·6	181·92
	·29	108·75	130·5	120·83	145·	132·91	159·49	145·	174·	157·	188·4	169·16	202·99
	·3125	117·18	140·6	130·2	156·24	143·22	171·86	156·24	187·44	169·27	203·12	182·28	218·7
	·33	123·75	148·5	137·49	165·	151·24	181·48	162·	198·	178·74	214·48	192·49	230·98
	·35	131·25	158·5	145·88	175·	160·41	192·49	175·	210·	189·58	227·49	204·16	244·99
	·375	140·6	168·72	156·24	187·5	171·87	206·24	187·5	225·	203·12	243·78	218·7	262·44
42 inches.	·1875	66·96	80·35	74·49	89·38	81·84	98·20	89·28	107·13	96·72	116·	104·16	124·99
	·21	75·	90·	83·32	99·98	91·66	109·99	100·	120·	108·32	129·98	116·66	139·99
	·23	82·14	98·56	91·23	109·47	100·	120·	109·52	131·42	118·64	142·36	127·77	153·32
	·25	89·2	107·	99·2	119·	109·12	130·94	119·	142·8	128·96	154·75	138·88	166·66
	·26	92·7	111·24	103·17	123·8	113·49	136·18	123·8	148·56	134·12	160·94	144·44	173·31
	·29	103·57	124·28	115·	138·	126·58	151·89	138·	165·6	149·6	179·52	161·11	193·33
	·3125	111·6	133·92	124·	148·8	136·4	163·68	148·76	178·57	161·2	193·48	173·6	208·33
	·33	117·85	141·42	130·94	157·	144·	172·8	157·14	188·56	170·23	204·27	183·33	219·99
	·35	125·	150·	138·88	166·66	152·77	183·32	166·	199·99	180·55	216·66	194·44	233·32
	·375	133·92	160·7	148·8	178·57	163·68	196·41	178·57	214·28	193·48	232·17	208·33	249·96
44 inches.	·1875	63·92	76·7	71·	85·2	78·12	93·74	85·22	102·26	92·32	110·8	99·42	119·3
	·21	71·59	85·9	79·54	95·44	87·49	104·98	95·44	114·52	103·4	124·	111·35	133·62
	·23	78·4	94·	87·11	104·54	95·83	114·99	104·54	125·44	113·25	135·9	121·96	146·35
	·25	85·2	102·24	94·69	113·63	104·16	124·99	113·63	136·35	123·1	147·72	132·5	159·
	·26	88·6	106·32	98·48	118·18	108·33	129·99	118·18	141·81	128·	153·6	137·8	165·36
	·29	98·86	118·63	109·98	131·82	120·83	144·99	131·82	158·18	142·8	171·36	153·79	185·37
	·3125	106·53	127·83	118·37	142·	130·2	156·24	142·	170·4	153·87	184·68	165·7	198·84
	·33	112·5	135·	124·99	149·98	137·5	164·98	150·	180·	162·49	194·98	174·99	209·98
	·35	119·31	143·17	132·57	159·	145·83	174·99	159·	190·8	172·34	206·8	185·6	222·72
	·375	127·84	153·4	142·	170·4	156·24	187·48	170·4	204·48	184·68	221·6	198·84	238·
46 inches.	·1875	61·14	73·36	67·93	81·51	74·72	89·66	81·51	97·81	88·31	105·97	95·1	114·12
	·21	68·47	82·16	76·	91·3	83·69	100·42	91·3	109·56	98·9	118·68	106·51	127·81
	·23	75·	90·	83·33	100·	91·66	109·99	100·	120·	108·33	129·99	116·66	139·99
	·25	81·5	97·8	90·57	108·69	99·63	119·55	108·69	130·42	117·74	141·28	126·8	152·16
	·26	84·7	101·64	94·2	113·	103·62	124·34	113·	135·6	122·46	146·95	131·87	158·24
	·29	94·56	113·47	105·	126·	115·58	138·69	126·	151·2	136·6	163·92	147·1	176·52
	·3125	101·9	122·28	113·22	135·86	124·54	149·45	135·86	163·	147·19	176·62	158·5	190·2
	·33	107·6	128·12	119·99	143·98	131·51	157·81	143·98	172·16	155·43	186·51	167·38	200·85
	·35	114·13	136·95	126·8	152·17	139·49	167·38	152·17	182·6	164·85	197·82	177·53	213·
	·375	122·28	141·73	135·87	163·	149·45	179·34	163·	195·6	176·62	211·98	190·2	228·24
48 inches.	·1875	58·59	70·30	65·1	78·12	71·61	85·93	78·12	93·74	84·63	101·5	91·13	109·35
	·21	65·62	78·74	72·91	87·49	80·2	96·24	87·49	105·	94·78	113·73	102·	122·4
	·23	71·87	86·24	79·85	95·83	87·84	105·4	95·83	114·99	103·81	124·57	111·8	133·16
	·25	78·1	93·72	86·8	104·16	95·48	114·57	104·16	124·99	112·84	135·4	121·5	145·3
	·26	81·25	97·50	90·27	108·33	99·3	119·16	108·33	129·99	117·35	140·82	126·37	151·64
	·29	90·62	108·76	100·69	120·83	110·76	132·91	120·83	145·99	130·9	157·8	140·97	169·16
	·3125	97·65	117·18	108·	130·2	119·35	143·22	130·2	156·25	141·	169·2	151·9	182·27
	·33	103·12	123·74	114·57	137·48	126·	151·2	137·5	165·	148·95	178·74	160·41	192·49
	·35	109·37	131·24	121·52	145·83	133·67	160·4	145·83	174·99	157·98	189·57	170·13	204·15
	·375	117·18	140·61	130·2	156·25	143·22	171·86	156·25	187·50	169·29	203·14	182·27	218·72

Diameter of Boiler.	Thickness of Plates.	45,000 Tensile Strain. ⅙ Tensile Strain, 7,500.		50,000 Tensile Strain. ⅙ Tensile Strain, 8,333·3.		55,000 Tensile Strain. ⅙ Tensile Strain, 9,166·6.		60,000 Tensile Strain. ⅙ Tensile Strain, 10,000.		65,000 Tensile Strain. ⅙ Tensile Strain, 10,833·3.		70,000 Tensile Strain. ⅙ Tensile Strain, 11,666·6.	
		Pressure.	20 per Cent. additional.	Pressure.	20 per Cent. additional.	Pressure.	20 per Cent. additional.	Pressure.	20 per Cent. additional.	Pressure.	20 per Cent. additional.	Pressure.	20 per Cent. additional.
54 inches.	·1875	52·	62·4	57·62	69·44	63·65	76·38	69·44	82·44	75·21	90·25	81·	97·2
	·21	58·33	69·99	64·81	77·77	71·29	85·54	77·77	93·32	84·25	101·1	90·73	108·87
	·23	63·88	76·65	70·98	85·18	78·	93·6	85·18	102·21	92·28	110·73	99·38	119·25
	·25	69·44	83·32	77·16	92·59	84·87	101·84	92·59	110·1	100·3	120·36	108·	129·60
	·26	72·22	86·66	80·24	96·29	88·27	105·92	96·29	115·54	104·31	125·17	112·33	134·79
	·29	80·55	96·66	89·76	107·41	98·45	118·34	107·41	128·89	116·35	139·62	125·3	150·36
	·3125	86·8	104·16	96·45	115·73	106·	127·30	115·73	138 87	125·38	150·46	135·	162·
	·33	91·66	109·99	101·84	122·22	112·	134·4	122·22	146·66	132·4	158·88	142·55	171·
	·35	97·22	116·66	108·	129·62	118·82	142·58	129·62	155·54	140·42	168·5	151·23	181·47
	·375	104·16	124·99	115·74	138·88	127·3	152·76	138·88	165·76	150·46	180·57	162·	194·4
60 inches.	·1875	46·87	56·24	52·	62·4	57·29	68·74	62·4	75·	67·7	81·24	72·9	87·48
	·21	52·5	63·	58·33	69·99	64·16	76·99	69·99	84·	70·58	84 69	81·63	97·95
	·23	57·5	69·	63·86	76·63	70·27	84·32	76·63	91·99	83·	99·6	89·44	107·32
	·25	62·5	75·	69·44	83·33	76·38	91·65	83·33	99·99	90·27	108·32	97·2	116·64
	·26	65·	78·	72·22	86·66	79·44	95·32	86·66	103·99	93·88	112·65	101·1	121·32
	·29	72·5	87·	80·55	96·66	88·61	106·33	96·66	115·99	104·72	125·66	112·78	135·33
	·3125	78·12	93·74	86·8	104·16	95·48	114·58	104·16	125·	112·84	135·43	121·52	145·8
	·33	82·5	99·	91·66	109·99	100·8	120·96	109·99	132·	119·16	142·99	128·33	153·99
	·35	87·5	105·	97·22	116·66	106·61	127·93	116·66	139·99	126·38	151·65	136·11	163·33
	·375	93·75	112·5	104·16	124·99	114·58	137·49	124·99	150·	135·43	162·51	145·8	174·96
66 inches.	·1875	42·79	51·34	47·34	56·8	52·	62·4	56·8	68·16	61·55	73·86	66·3	79·56
	·21	47·72	57·26	53·	63·63	58·33	69·99	63·63	75·35	68·63	82·35	74·23	89·
	·23	52·27	62·72	58·	69·69	63·88	76·65	69·69	83·62	75·5	90·6	81·31	97·57
	·25	56·86	68·17	63·13	75·75	69·44	83·32	75·75	90·90	82·	98·4	88·37	106·
	·26	59·	70·8	65·65	78·78	72·22	86·66	78·78	94·53	85·35	102·42	91·91	110·29
	·29	65·91	79·	73·23	87·87	80·55	96·66	87·87	105·44	95·2	114·24	102·52	123·
	·3125	71·	85·2	78·91	94·69	86·8	104·16	94·69	113·62	102·6	123·1	110·47	132·56
	·33	75·	90·	83·33	99·99	91·66	109·99	99·99	120·	108·33	129·99	116·66	139·99
	·35	79·54	95·44	88·38	106·	97·22	116·66	106·	127·2	114·89	137·86	123·73	148·47
	·375	85·2	102·26	94·69	113·62	104·16	124·99	113·62	136·32	123·1	147·74	132·56	159·
72 inches.	·1875	39·	46·8	43·4	52·	47·74	57·28	52·	62·4	56·42	67·70	60·75	72·9
	·21	43·75	52·5	48·6	58·33	53·46	64·15	58·33	69·99	63·19	75·82	68·	81·6
	·23	47·9	57·49	53·23	63·88	58·56	70·27	63·88	76·65	62·21	83·	74·53	89·43
	·25	52·	62·4	57·87	69·44	63·65	76·38	69·44	83·32	75·22	90·26	81·	97·2
	·26	54·1	64·92	60·18	72·22	66·2	79·44	72·22	86·66	78·23	93·87	84·22	101·
	·29	60·41	72·49	67·13	80·55	73·56	88·27	80·55	96·66	87·26	104·76	93·98	112·77
	·3125	65·1	78·12	72·35	86·8	79·56	95·48	86·8	104·16	94·	112·86	101·26	121·5
	·33	68·75	82·5	76·38	91·66	84·	100·8	91·66	109·99	99·3	119·16	106·94	128·33
	·35	72·91	87·49	81·	97·22	89·11	106·93	97·22	116·66	105·32	126·38	113·42	136·1
	·375	78·12	93·74	86·8	104·16	95·48	114·54	104·16	124·99	112·86	135·43	121·5	145·8
78 inches.	·1875	36·	43·	40·	48·	44·	52·8	48·	57·60	52·	62·4	56·1	67·32
	·21	40·38	48·45	44·86	53·83	49·35	59·22	53·83	64·60	58·33	69·98	62·81	75·37
	·23	44·23	53·	49·13	58·95	54·	64·8	58·95	70·76	63·88	76·65	70·61	84·73
	·25	49·34	58·86	53·67	64·4	58·76	70·51	64·4	76·92	69·44	83·33	74·7	89·64
	·26	50·	60·1	35·55	66·66	66·11	73·33	66·66	79·99	72·22	86·66	77·77	93·32
	·29	55·77	66·92	61·96	74·36	68·16	81·79	74·36	89·23	80·55	96·66	86·75	104·1
	·3125	60·	72·1	66·77	80·12	73·45	88·13	80·12	96·15	86·8	104·16	93·47	112·17
	·33	63·46	76·15	70·51	84·61	77·56	93·	84·61	101·53	91·66	109·99	98·71	118·45
	·35	67·3	80·76	74·78	89·74	82·26	98·71	89·74	107·68	97·22	116·66	107·45	128·94
	·375	72·1	86·53	80·12	96·15	88·13	105·75	96·15	115·38	104·16	124·99	112·17	134·61
84 inches.	·1875	33·48	40·17	37·2	44·64	40·92	49·1	44·64	53·52	48·36	58·	52·	62·4
	·21	37·5	45·	41·66	49·99	45·83	54·99	49·99	60·	54·16	64·99	58·33	69·99
	·23	41·	49·	45·63	54·75	50·19	60·22	54·75	65·71	59·32	71·18	63·88	76·65
	·25	44·64	53·56	49·6	59·5	54·56	65·47	59·5	71·4	64·48	77·37	69·4	83·28
	·26	46·42	55·7	51·58	61·9	56·74	68·	61·9	74·28	67·	80·4	72·21	86·66
	·29	51·78	62·13	57·54	69·	63·29	75·94	69·	82·8	74·8	89·76	80·55	96·66
	·3125	55·8	66·96	62·	74·4	68·2	81·84	74·4	89·28	80·6	96·72	86·8	104·16
	·33	58·92	70·7	65·47	78·66	72·	86·4	78·66	94·28	85·11	102·13	91·66	109·99
	·35	62·5	75·	69·42	83·33	76·38	91·65	83·33	99·99	90·27	108·32	97·22	116·66
	·375	66·96	80·35	74·4	89·28	81·84	98·2	89·28	107·13	96·72	116·06	104·1	124·99
90 inches.	·1875	31·25	37·5	34·72	41·66	38·19	45·82	41·66	49·99	45·13	54·15	48·6	58·32
	·21	35·	42·	38·88	46·66	42·77	51·32	46·66	55·99	50·55	60·66	54·44	65·32
	·23	38·33	45·99	42·59	51·11	46·85	56·22	51·11	61·33	55·36	66·43	59·62	71·54
	·25	41·66	49·99	46·29	55·55	50·92	61·1	55·55	66·66	60·18	72·21	64·8	77·77
	·26	43·33	51·99	48·14	57·77	52·96	63·55	57·77	69·32	62·59	75·1	67·4	81·
	·29	48·33	57·99	53·7	64·44	59·	70·8	64·44	77·32	69·81	83·77	75·18	90·21
	·3125	52·	62·5	57·87	69·44	63·65	76·38	69·44	83·33	75·2	90·24	81·	97·2
	·33	55·	66·	61·1	73·33	67·22	80·66	73·33	87·99	79·44	95·32	85·55	102·66
	·35	58·33	69·99	64·81	77·77	71·29	85·54	77·77	93·32	84·25	101·1	90·74	108·88
	·375	62·5	75·	69·44	83·	76·38	91·65	83·33	99·99	90·24	108·34	97·2	116·64
96 inches.	·1875	29·29	35·14	32·55	39·	35·8	42·96	39·	46·8	42·31	50·77	45·5	54·6
	·21	32·81	39·87	36·46	43·75	40·1	48·12	43·75	52·5	47·39	56·86	51·	61·2
	·23	35·93	43·11	39·92	47·9	43·92	52·7	47·9	57·49	51·9	62·28	55·9	67·
	·25	39·	46·8	43·4	52·	47·74	57·28	52·	62·4	56·37	67·64	60·8	72·96
	·26	40·62	48·74	45·14	54·16	49·65	59·58	54·16	64·99	58·58	70·29	63·19	75·82
	·29	45·31	54·37	50·34	60·4	55·38	66·45	60·4	72·5	65·45	78·54	70·48	84·57
	·3125	48·82	58·58	54·25	65·1	59·67	71·61	65·1	78·12	70·52	84·63	75·95	91·14
	·33	51·56	61·87	57·3	68·75	63·	75·6	68·75	82·5	74·44	89·32	80·2	96·24
	·35	54·68	65·61	60·76	72·91	66·83	80·19	72·91	87·49	78·99	94·78	85·	102·
	·375	58·58	70·29	65·1	78·12	71·61	85·93	78·12	93·74	84·63	101·55	91·13	109·35

GENERAL RULES and REGULATIONS prescribed by the Board of Supervising Inspectors of Steam Vessels, in pursuance of the Act of Congress, approved 28th February 1871.

RELATING TO PRESSURES, BOILERS, AND THE INSPECTION OF BOILER-PLATES.

RULE 1.

PRESSURE allowable on Boilers of various dimensions, built prior to 28th February 1872.

(Pressure equivalent to the standard pressure for a 42-inch boiler, $\frac{1}{4}$-inch iron.)

Wire Gauge.	Thickness of Iron.	34 Inches in Diameter.	36 Inches in Diameter.	38 Inches in Diameter.	40 Inches in Diameter.	42 Inches in Diameter.	44 Inches in Diameter.	46 Inches in Diameter.
	Inch.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
1 - - - - -	5-16	169.85	160.41	151.97	144.37	137.50	131.25	125.54
2 - - - - -	14-48	158.52	149.72	141.84	134.75	128.33	122.50	117.17
3 - - - - -	13-48	147.20	239.03	131.76	125.12	119.16	113.75	108.80
4 - - - - -	1-4	135.88	128.33	121.57	115.50	110.00	105.00	100.43
5 - - - - -	11-48	124.55	117.63	111.44	105.87	100.83	96.25	92.06
6 - - - - -	10-48	113.23	106.94	101.31	96.25	91.66	87.50	83.69
7 - - - - -	3-16	101.91	96.24	91.18	86.62	82.50	78.75	75.32

Boilers, however, built of steel plates prior to 28 February 1872 shall be deemed to have a tensile strength of 75,000 pounds to the sectional square inch whether stamped or not, and shall be tested under the rule prescribed for boilers inspected under the provisions of Section 36 of the Act relating to boilers built after the 28th of February 1872.

TABLE of Pressures allowable on Boilers made since 28th February 1872.

Rule 2. In the first column to the left will be found the diameter of boilers, varying by 2″ from 36″ to 48″, and by 6″ from 48″ to 96″. In the second column will be found the thickness of boiler-plates, expressed in the decimal parts of an inch, and varying—by $\frac{2}{100}$″ nearly—from $\frac{3}{16}$″ to $\frac{3}{8}$″; .1875, .25, .3125, and .375 are the decimal equivalents for $\frac{3}{16}$″, $\frac{1}{4}$″, $\frac{5}{16}$″, and $\frac{3}{8}$″. The decimals .21, .23, .26, and .29, correspond nearly to $\frac{10}{48}$″, $\frac{11}{48}$″, $\frac{13}{48}$″, and $\frac{14}{48}$″ in the Table of Pressure allowable on Boilers made prior to 28th February 1872. At the heads of the double columns will be found the tensile strength of the plates per square inch of section; also $\frac{1}{16}$ of that amount. The pressures allowable on single-riveted boilers will be found in the first divisions of the double columns under the tensile strengths and opposite the diameters and thicknesses; and in the second divisions, the pressures allowable on boilers where all the rivet-holes have been fairly drilled instead of punched, and the longitudinal laps of their cylindrical parts double riveted.

The pressure for any dimension of boilers not found in the above Table, can be ascertained by the following rule, viz.:

Multiply one-sixth ($\frac{1}{6}$″) of the lowest tensile strength found stamped on any plate in the cylindrical shell, by the thickness—expressed in inches or parts of an inch—of the thinnest plate in the same cylindrical shell, and divide by the radius or half diameter—also expressed in inches—and the sum will be the pressure allowable per square inch of surface for single riveting, to which add twenty per centum for double riveting, &c.

The hydrostatic pressure applied, under the above Table and rule, must be in the proportion of one hundred and fifty pounds to the square inch to one hundred pounds to the square inch of the working pressure allowed.

Where flat surfaces exist, the inspector must satisfy himself that the bracing, and all other parts of the boiler, are of equal strength with the shell, and he must also, after applying the hydrostatic test, thoroughly examine every part of the boiler to see that no weakness or fracture has been caused thereby. Inspectors must see that the flues are of proper thickness to avoid the danger of collapse.

Flues of sixteen inches in diameter must not be less than one-quarter of an inch in thickness, and in proportion for flues of a greater or less diameter.

Rule 3. Every iron or steel plate intended for the construction of boilers to be used on steam vessels, shall be stamped by the manufacturer in the following manner, viz.: At the diagonal corners, at a distance of about four inches from the edges, and also at or near the centre of the plate, with the name of the manufacturer, the place where manufactured, and the number of pounds tensile strain it will bear to the sectional square inch.

The manner of inspecting, testing, and stamping boiler-plates, by the United States inspectors, shall be as follows, viz.:

The sheets to be inspected and tested shall be selected by the inspectors, indiscriminately, from the lot presented, and shall not be less than one-tenth of the entire lot so presented, and from every such selected sheet the inspector shall cause a piece to be taken, for the purpose of ascertaining its strength, the area of which shall equal one quarter of one square inch, and the force at which this piece can be parted in the direction of its fibre or grain, represented by pounds avoirdupois multiplied by four, shall be the tensile strength, and the lot from which the test-sheets were taken shall not be marked above the lowest number represented by these tests. The inspector shall also subject a piece taken from each selected sheet to repeated heating and cooling, and shall bend it short, both in a hot and a cold state, and shall draw it out under the hammer, as it is called, in order to ascertain the other qualities mentioned in Section 36 of the Act aforesaid; and should these test-pieces be found deficient in these qualities, the inspectors shall refuse to place the Government stamp on the lot from which these test-sheets were taken; but if the test-pieces should prove to possess these qualities, then the inspector shall proceed to stamp the entire lot from which they were taken with the letters "U. S." and the figure denoting the inspection-district in which the inspection was made.

All boiler-plates tested and stamped as above shall be considered as having been inspected according to law; but should any local or other inspector have valid reasons for believing that fraud has been practised, and that the stamps upon any such boiler-plates are false, in whole or in part, he is empowered to re-inspect and test the same.

The provisions of this rule shall take effect as soon as the inspectors are appointed, and the manufacturers of boiler-plates notified of the same.

In the following Table will be found the widths, expressed in hundredths of an inch, that will equal one-quarter of one square inch of section of the various thicknesses of boiler-plates. The signs + (plus) and — (minus) indicate that the numbers against which these signs are placed are a trifle more, or less, but will not, in any one instance, exceed three one-thousandths of an inch.

The gauge to be employed, by inspectors and others, to determine the thickness of boiler-plates, and the widths in the Table, will be the Darling, Brown, and Sharp's gauge, of Providence, Rhode Island, and will be furnished by the Treasury Department. This gauge has been approved by the Board of Supervising inspectors.

$\frac{3}{16}''$ = 133 —	.26 = 96 —	.35 = 71 —
.21 = 119 —	.29 = 86 —	$\frac{3}{8}''$ = 67 +
.23 = 109 +	$\frac{5}{16}$ = 80	$\frac{7}{16}$ = 57 —
$\frac{1}{4}''$ = 100	.33 = 76 +	$\frac{1}{2}''$ = 50

Rule 4. The hulls and boilers of all tug, towing, and freight-boats shall be inspected in accordance with Section 59 of the Act aforesaid, but steam-registering gauges shall not be required on the above-named steamers.

Rule 5. The feed-water shall not be admitted into any boiler on board of any steam-vessel subject to the jurisdiction of this Board, at a less temperature than one hundred (100) degrees Fahrenheit for low-pressure or condensing boilers, and one hundred and eighty (180) degrees Fahrenheit for high-pressure or non-condensing boilers; nor shall cold water be admitted into any such boilers while the water is at a less temperature than the surrounding atmosphere.

Rule 6. Whenever steamers use a pressure upon their boilers exceeding sixty pounds to the square inch, they shall be inspected as high-pressure steamers, and designated as such.

Rule 7. Inspectors shall not hereafter allow the use of donkey boilers of the vertical tubular kind on steamers navigating the waters flowing into the Gulf of Mexico.

Rule 8. Stand-pipes used on high-pressure western river steamers shall be constructed of iron, tested and stamped as required by law; but when a steamer is to be navigated in salt waters, and, in the opinion of the supervising inspector, cast-iron may be employed with greater safety, he may allow stand-pipes constructed of cast-iron to be used on steamers of the latter class.

Rule 9. All steamers hereafter constructed, navigating the ocean, sounds, lakes, bays, and rivers, and subject to the jurisdiction of the Board, shall have a clear space of not less than sixteen inches on all sides of the boilers, and at the back end of all such boilers there shall be a clear space of two feet. Slip-joints in steam-pipes shall, in their working parts, when the steamer is to be employed in navigating salt waters, be made of copper or composition.

Relating to Life-saving Apparatus.

Rule 1. Where ladders or steps are necessary to enable passengers on board to escape conveniently to the boats, such steps shall be provided and placed on each side of the steamer, with man-ropes of suitable size and of sufficient length to reach the water; and one of the means of escape from one deck to another, as required by law, shall be near the stern of the vessel. Extra steering apparatus for all steamers carrying passengers, consisting of relieving tackles or tiller, must be provided.

Rule 2. Every steam-vessel navigating rivers only (except ferry-boats, freight-boats, canal-boats, and towing-boats of less than fifty tons), shall have at least one good substantial yawl-boat, with lines attached and properly supplied with oars, and kept in good condition at all times for immediate use. And in addition thereto, all passenger steamers shall be required to have one metallic life-boat in the ratio of one such boat for every sixty passengers allowed to be carried on such steamer by their certificates. The metallic life-boats shall not be required on western rivers.

Rule 3. Steamers engaged in excursions, whether on rivers or bays, shall be equipped in such manner as, in the opinion of the supervising inspector of the district, will best apply to the navigation in which they are engaged, but no such steamer shall be navigated without one good yawl and one metallic life-boat.

Rule 4. Every steamer navigating the oceans or the great northern and north-western lakes, shall be equipped with life-boats in the ratio of one boat for every thirty persons allowed to be carried as passengers, or employed as crew, on board such steamer. The number of boats in each case to be determined by the inspectors according to their certificate of inspection, which shall state upon its face the maximum number of passengers permitted to be carried, and the number of persons constituting a full crew for such steamer. At least one of the boats so required shall be metallic, and the balance may be of wood or iron, as the inspectors may determine, being governed by the character of the navigation in which the vessel is to be employed. Every life-boat shall be rated with respect to the number of persons it may be allowed to carry, according to its size and buoyancy: Provided, however, that if it shall be more convenient, in the opinion of the inspectors and owner or owners, to equip in part any such steamer with life-rafts, approved by the supervising inspectors and by the Secretary of the Treasury, the inspectors may allow the use of such number of rafts as in their opinion may, in addition to the life-boats provided, be necessary for the safety of passengers, in proportion to the number which such steamer is allowed to carry. Other life-saving appliances, approved by the Board of Supervising Inspectors and by the Secretary of the Treasury, may also be allowed, and shall be rated as equivalents in the proportion to which the buoyancy and capacity of such appliances may entitle them. All wooden boats hereafter made for use on passenger steamers shall be clincher built. So many of the life-boats as can be conveniently carried on cranes or davits shall be so carried, and the remainder shall be stowed in the most convenient places for use. Steamers navigating the Pacific Ocean shall not be required to carry more than twenty-five life-boats, or their equivalent.

Rule 5. Every steamer navigating the bays or sounds of the United States shall be equipped with not less than one life-boat for every sixty persons she is allowed by her certificate to carry, including the crew, one at least of which boats shall be metallic. So many of such boats as can be conveniently carried on cranes

or davits shall be so carried; the remainder shall be stowed in the most convenient places for launching. If, in the opinion of the inspectors and owners, it shall not be covenient to carry the requisite number of such boats, other life-saving appliances, approved by the Board of Supervising Inspectors and by the Secretary of the Treasury, may be substituted therefor in the ratio to which the buoyancy and capacity of such appliances may entitle them.

Rule 6. Every metallic life-boat required by law on steamers carrying passengers shall be substantially constructed of galvanized iron, of not less than No. 18 wire-gauge in thickness, and of such dimensions and capacity as will sustain in and around it, when afloat, at least thirty persons, and shall have, when filled with water, a buoyancy of at least eight hundred pounds, and every such life-boat shall be equipped with life-lines around the gunwales; shall have a good rope painter of suitable size, and not less than 50 feet in length, attached, and shall be supplied with a proper complement of oars.

Rule 7. Every raft, used or required by law for safety of life upon any steamer subject to the jurisdiction of the Board, shall be substantially constructed either of copper, galvanized iron, rubber, wood, or other suitable material, combined or separate, and of such form as shall be best adapted to the character of the navigation in which such steamer is or shall be engaged. Every such raft shall have a capacity to sustain upon and around it, when in the water, at least fifteen persons, and shall be suitably equipped with life-lines, painter, and oars, so that such raft may be conveniently handled and navigated: Provided, however, that no kind of rafts shall be used, as aforesaid, that shall not have been first approve by the Board of Supervising Inspectors and by the Secretary of the Treasury.

Rule 8. Drags, or floating anchors, as required by Section 52 of the Act aforesaid, should be constructed of pine plank, not less than two inches in thickness, riveted together transversely, and should contain, by superficial measurement, a weight proportioned to the tonnage of the vessel. The drag may be connected with the ship's cable by a bridle of iron rods or chains and shackle, and should be so constructed as to be capable of being compactly stowed near the head of the ship. Steamers navigating the oceans should be provided with at least one drag, of dimensions as follows: For ships of four hundred tons, or under, not less than twenty-five superficial feet; of six hundred tons, not less than thirty-six feet; of one thousand tons, not less than fifty feet; of fifteen hundred tons, not less than eighty feet; of twenty-five hundred tons, not less than one hundred feet; and in this ratio for all vessels of a greater or intermediate burden not above stated.

Steamers whose routes do not extend "off anchorage" are not required to have drags or floating anchors on board.

Rule 9. Every life-preserver, adjustable to the body of a person, shall be made of good sound cork blocks, with belts and shoulder straps properly attached, and shall be so constructed as to place the cork underneath the shoulders and around the body of the person wearing it; and it shall be the duty of the inspectors to see by actual examination that every such life-preserver contains at least six pounds of good cork, which shall have a buoyancy of at least four pounds to each pound of cork.

Inspectors are further required to direct such life-preservers to be distributed throughout the cabins, state-rooms, berths, and other places convenient for passengers on such steamer; and there shall be a printed notice posted in every cabin and state-room, and in conspicuous places about the decks, informing passengers of the location of life-preservers and other life-saving appliances, and of the mode of applying or adjusting the same.

Rule 10. The "water-tight cross bulkheads," required by Section 53 of the Act aforesaid, shall, for wooden hulls, be made of iron plates, well fastened to suitable framework, which framework must be firmly secured to the hulls, and caulked; for iron hulls they shall be made of iron plates, not less than one-quarter of an inch in thickness, well secured to the framework of the hulls and strengthened by a stanchion of angle-iron, placed not more than two feet from centre to centre. Of these bulkheads one must be placed immediately forward of, and one immediately abaft, the engines and boilers: the third, or collision bulkhead, to be placed fifteen or twenty feet from the stern.

Relating to Fire Apparatus and Combustibles.

Buckets, Barrels, and Axes.

Rule 1. All passenger steamers are required to be provided with fire-buckets, barrels, and axes, as follows, viz.:

	Tons.	Barrels.	Buckets.	Axes.
All steamers not over - - - - -	200	2	18	4
All steamers over 200 tons, and not over - -	500	4	24	6
All steamers over 500 tons, and not over - -	1,000	6	35	8
All steamers over 1,000 tons, not less than - -	- -	8	50	10

For tug, tow, freight, and small ferry steamers;

	Tons.	Barrels.	Buckets.	Axes.
All steamers less than - - - - -	50	- -	5	1
All steamers over 50, and not over - - -	100	- -	8	2
All steamers over 100, and not over - - -	200	1	12	2
All steamers over 200, and not over - - -	500	2	15	3
All steamers over 500, and not over - - -	1,000	3	20	4
All steamers over 1,000 tons, not less than - -	- -	4	25	5
Provided, however, that tanks of suitable dimensions and arrangement, or buckets in sufficient number, may be substituted for barrels on all vessels. Five buckets shall be considered as equivalent for one barrel.				

Fire-buckets, barrels, or tanks, required by law, must be kept constantly filled with water, and in such positions on board as shall be most convenient for the extinguishment of fire.

All axes must be so located as to be readily found in time of need; must not be used for general purposes, and must be kept in good condition.

Rule 2. All hay carried on the decks of passenger steamers shall be covered by a tarpaulin while on board.

Rule 3. All steamers on western rivers which have their boilers so situated that sparks from the fires may be driven back among the freight or other combustible material, shall have a sheet-iron fender extending forward from the fire-doors not less than two feet, at the height of the furnace-fronts, and connecting with the same.

Rule 4. The pipes required by law, on board of steamers, to convey steam from their boilers to the holds, and the separate compartments of the same, except that portion set apart for cabins, shall in no case be less than one and a half inches in diameter, and the branches leading to the several compartments of the hold of a vessel shall be supplied with valves, the handles of which shall be marked so as to indicate the compartments or parts of the vessel into which the pipes lead. These valves or their handles shall be placed in the most accessible part of the main deck of the vessel, and so arranged, when practicable, that all can be enclosed in a box or casing, the door of which shall be plainly marked with the words "steam fire-apparatus."

Rule 5. Steamers required by law to be provided with double-acting steam fire-pumps, or their equivalents for throwing water, shall be allowed to select the same from any such as are recognised by the Board of Supervising Inspectors, and approved by the Secretary of the Treasury, as good and efficient pumps, and shall be provided according to their tonnage as follows, viz.:

For a steamer of not more than two hundred tons burden, four inches stroke and two inches diameter of plunger, or its equivalent.

Of more than two and not over five hundred tons burden, seven inches stroke and four inches diameter of plunger, or its equivalent.

Of more than five hundred and not over one thousand tons burden, seven inches stroke and six inches diameter of plunger, or its equivalent.

Of more than one thousand and not over fifteen hundred tons burden, ten inches stroke and six inches diameter of plunger, or its equivalent.

Of more than fifteen hundred and not over two thousand tons burden, ten inches stroke and eight inches diameter of plunger, or its equivalent.

Of more than two thousand and not over twenty-five hundred tons burden, twelve inches stroke and eight inches diameter of plunger, or its equivalent.

Of more than twenty-five hundred and not over three thousand tons burden, twelve inches stroke and ten inches diameter of plunger, or its equivalent.

Steamers are not restricted to the above particular proportions for fire-pumps; any other dimensions equal to or greater in capacity may be allowed.

The diameter of the pipes leading from the pumps must in no case be less than that of the discharge opening of the pumps.

A rotary pump, when driven by an engine independent of the main engine, or a steam siphon-pump, may be considered as an equivalent for the double-acting fire-pump, and used as such when equal to it in efficiency and the degree of capacity required.

Rule 6. Any steamer having on board an independent steam-pump and an auxiliary boiler, suitably arranged, and of sufficient strength and capacity to test the boilers thereof,—or if one of the hand fire-pumps, required by law, be suitably arranged and of sufficient strength and capacity for testing boilers; or if the "doctor," so called, when arranged permanently for testing the boilers, is, in the judgment of the inspectors, suitable for the purposes intended,—may be considered as having complied with the law requiring all steamers to be supplied with such pumps.

Rule 7. Any steamer of two hundred tons burden or under, required by law to have a double-acting steam fire-pump, and having in use on board "a doctor," so called, such "doctor" may be considered a lawful equivalent for such pump when it has pipes attached to it leading to the upper and between decks, such pipes being provided with hose and valves according to law; but the pipes shall in no case be less than one and a half inches in diameter. The pump for supplying the boilers shall in no case be considered as an equivalent for the double-acting steam fire-pump on steamers above two hundred tons burden.

Rule 8. All steam fire-pumps required by law on steam-vessels shall be supplied with connection-pipes leading to the hold of the vessel, with stop-cocks or shut off valves attached, and so arranged that such pumps may be used for pumping and discharging water overboard from the hold; and each compartment bulkhead shall be fitted with valves, so as to admit water from one compartment to the other, and the valves so arranged as to be worked from the main-deck. And, in addition to these steam fire-pumps so arranged, where the bilge-injection does not exist in steamers, there shall be supplied to every steamer carrying passengers, and navigating waters other than rivers only, such number of pumps or steam-siphons as shall be equal to the capacity of such steam fire-pumps.

Rule 9. So much of Section 3 of the Act aforesaid as requires donkey or steam fire-pumps to be placed on the main-deck shall not apply to ferry-boats; donkey-pumps on such boats may be placed either on the deck or in the hold, as may be most convenient.

Rule 10. All steamers of one hundred tons or upward, carrying passengers, when lying at the wharf or landing, without steam to work the pumps, shall be provided with fire-extinguishers approved by the Board of Supervising Inspectors and by the Secretary of the Treasury, in the following proportions, viz.:

For steamers under five hundred tons burden and above one hundred, two of such extinguishers.

For steamers of five hundred tons burden and under one thousand five hundred, three of such extinguishers.

For steamers of one thousand five hundred tons burden and under two thousand five hundred tons, four of such extinguishers.

For steamers of two thousand five hundred tons burden and over, five of such extinguishers.

The

The local inspector shall designate the place or places, on board of steamers most convenient to be reached in case of fire, where these extinguishers shall be kept.

No fire-extinguisher shall be allowed which is not guaranteed for one year by the manufacturer and dealer, and which has not been subjected to a hydrostatic pressure of at least 75 per cent. above the pressure of the gas generated therein. The pressure to which each machine has been subjected shall be conspicuously marked upon the same.

Rule 11. Refined petroleum, which will not ignite at a temperature less than one hundred and ten degrees Fahrenheit, may, upon routes where there is no other practicable mode of transporting it, be carried on passenger-steamers, upon the guards or forward main-deck thereof, and at a safe distance from any fire: Provided, The same shall be securely put up in good metallic cans or vessels, and carefully packed in boxes, or in iron-bound casks or barrels, and the boxes, casks, or barrels plainly marked upon the heads thereof with the manufacturer's name, the name of the article, and the degree of temperature (Fahrenheit) at which the petroleum will ignite; and all such boxes, casks, or barrels shall be placed and carried only upon the outer edge of the guards and decks as aforementioned. Any oil which will stand a fire-test of three hundred (300) degrees Fahrenheit may be carried as freight, or used as stores, on passenger-steamers.

Any violation of this rule will subject the offender to the penalty for such violation imposed by the Act of Congress relating to steam-vessels, approved 28th February 1871.

Rule 12. It shall be the duty of local inspectors, before granting a certificate to any steamer, to see her fire apparatus, such as pumps, hose, &c., put in use, and to ascertain that they are all in good condition.

Rule 13. Every sea-going steamer carrying passengers shall be supplied with an auxiliary or donkey boiler of sufficient capacity to work the fire-pumps.

Relating to Instruments.

Rule 1. All steam-registers shall be so constructed as to be operated wholly by the pressure of steam in the boilers to which said steam-registers are attached; and their mechanism shall be inclosed in a metal case, so arranged as to preclude the possibility of its being interfered with from the outside, and be secured by a lock or such other device as the Board of Supervising Inspectors and the Secretary of the Treasury shall approve; said steam-registers shall be provided with a suitable stop-cock to shut off the steam from the register in case of necessity, and such stop-cock shall be so placed and arranged as to be secured or locked by the same device or lock employed to secure the register from the interference of unauthorised persons. The front or face of all registers shall be of heavy glass, to enable passengers and others to observe at all times the pressure of steam. The number of times the working pressure allowed has been exceeded, and the highest point attained, may be registered either upon a continuous strip of paper under a pencil moved by the variations in the pressure of steam, or by hands or pointers moving over a dial-plate or plates, arranged and graduated for that purpose.

All steam-registers shall be so constructed as to record each excess of more than two and a-half pounds above the working pressure allowed for low pressure boilers, and of more than five pounds above the working pressure allowed for high pressure boilers. And each steam-register, attached to either high or low-pressure boilers, shall be capable of recording at least ten pounds above the test pressure. All steam-registers shall be placed in a conspicuous position under the direction of the inspectors, who shall also prescribe the manner in which steam-registers shall be attached to boilers.

It shall be the duty of all inspectors, before issuing a certificate of inspection to any steamer, to ascertain, by actual test, that the steam-register required by law is in accordance with the foregoing rules. The makers and sellers of steam-registering gauges shall furnish to the purchaser an acceptable guarantee that the same will work correctly, and according to the law and rule, one year.

Rule 2. All steamers shall have inserted in their boilers plugs of Banca tin, at least one-half inch in diameter, in the following manner, to wit: cylinder boilers with flues shall have one plug inserted in the top of one flue of each

 boiler;

boiler; and also one plug inserted in the shell of each boiler from the inside immediately below the fire-line, and not less than four feet from the forward end of the boilers. All fire-box boilers shall have one plug inserted in the crown of the back connection.

Rule 3. All steamers having one or two boilers shall have three suitable gauge-cocks in each boiler; those having three or more boilers in battery shall have three in each outside boiler and two in each remaining boiler in the battery, and the middle gauge-cocks in all boilers shall not be less than four inches above the top of the flues, tubes, or crown of the fire-box.

Rule 4. Safety-valves attached to the boilers of all steam vessels hereafter built shall have an area of not less than twenty square inches for every five hundred feet of effective heating surface (half the flue and all other heating surface being taken as effective), and shall be so arranged that each boiler on the steamer shall have one separate safety-valve, unless the arrangement is such as to preclude the possibility of shutting off the communication of any boiler with the safety-valve or valves employed.

This arrangement shall also apply to lock-up safety-valves when they are employed. Lock-up safety-valves shall be such as are approved by the Board of Supervising Inspectors and by the Secretary of the Treasury, and of such dimensions as the inspectors may deem necessary; and all lock-up valves now in use on steamers shall be considered as in compliance with the law.

Rule 5. All steam-gauges heretofore in use on steamers shall be admissible by the inspectors, and other steam-gauges hereafter made, of equal merit, shall be allowed.

Rule 6. The appliances in use on steamers constructed prior to the 28th of February 1872, for determining the height of water in the boilers, shall be considered reliable low-water gauges.

Rule 7. Every device or appliance on board of steamers which is by law, or in the discretion of the inspectors, taken from the control of all persons navigating the same, shall be secured as the supervising inspector of the district may direct, with the approval of the Secretary of the Treasury.

Relating to Licensed Officers.

Rule 1. Before a license can be issued to any person to act as a master, mate, pilot, or engineer, he must personally appear before some local board, or a supervising inspector, for examination, according to law; but upon the renewal of such license, when the distance from any local board or supervising inspector is such as to put the person holding the same to great inconvenience and expense to appear in person, he may, upon taking the oath of office before any person authorised to administer oaths, and forwarding the same, together with the license to be renewed and Government fee, to the local board or supervising inspector of the district in which he resides or is employed, have the same renewed by the said inspectors, if no valid reason to the contrary be known to them: and they shall attach such oath to the stub end of the license, which is to be retained on file in their office.

Classification of Engineers.

Rule 2. The classification of engineers on the lakes and seaboard shall be as follows:

Chief engineers of ocean steamers.
Chief engineers of lake, bay, and sound steamers.
Chief engineers of river steamers.
First assistant engineers.
Second assistant engineers.
Third assistant engineers.
Special engineers.

All steamers of over one hundred tons burden shall carry at least one chief engineer.

First assistant engineers may act as first assistants on any steamer.

Second assistant engineers may act as first assistants on steamers of seven hundred and fifty tons and under and second assistants on any steamer.

Third

Third assistants may act as second assistants on steamers of seven hundred and fifty tons and under, and third assistants on any steamer.

Special engineers may be assigned to act, in any capacity for which they are qualified, on steamers of one hundred tons and under.

Inspectors may designate upon the certificate of any chief engineer the tonnage of the vessel on which he may act, and he may also designate any assistant engineer as special engineer on steamers of one hundred tons or under, and may restrict an engineer to a particular vessel.

Engineers on steamers navigating rivers flowing into the Gulf of Mexico shall be designated as first and second engineers. The first engineer shall rank as chief engineer. For steamers of one hundred tons and under, special engineers may be licensed, and may, at the option of the inspector, be restricted to a particular steamer.

Rule 3. The navigation of every steamer shall be under the control of a first-class pilot, who shall have a license as such, and every such pilot shall be limited in his license to the particular service to which he is adapted.

Rule 4. When an original license is issued to a pilot whose route extends beyond the jurisdiction for which the license is issued, it shall be the duty of the local board issuing such license to refer it to the local board of inspectors having jurisdiction over the remainder of his route, for their indorsement thereon.

This rule shall apply only to the seaboard, Gulf of Mexico, and rivers flowing into the Atlantic Ocean.

Rule 5. On all rivers flowing into the Gulf of Mexico (and their tributaries), where inspectors are called upon to extend a pilot's license beyond the usual route for which said pilot has been licensed, they may, on being fully satisfied, grant the same; or they may refer such application to the board of the district to which the extension may be desired, for the purpose of obtaining an indorsement of such grant on such license.

Rule 6. Inspectors, before granting or renewing a license to any person to act as a pilot, shall satisfy themselves, by examination, that he thoroughly understands the rules and regulations governing pilots.

Rule 7. The grade of an engineer or pilot shall not be raised, during the time for which his license was granted, by any other than the inspectors who granted the same, nor by them unless proper reasons are assigned therefor, which reasons shall be indorsed on the new certificate.

Rule 8. Whenever an engineer or pilot shall apply for a renewal of his license for the same grade, the presentation of the old certificate may be considered sufficient evidence of his title to renewal, unless such title has been forfeited, or facts shall have come to the knowledge of a member of the board which would render the renewal improper.

Rule 9. When the license of any master, mate, pilot, or engineer is revoked, such license virtually expires with such revocation, and any license subsequently granted to such person shall be considered in the light of an original license, and the usual fee shall be demanded and paid accordingly.

Rule 10. When the license of any master, mate, engineer, or pilot shall be suspended, the board making such suspension shall determine the term of its duration, or, in the absence of such determination, it shall be considered as without limitation, unless, on appeal to the supervising inspector, the action of the local board shall be reversed.

Rule 11. Masters, mates, engineers, and pilots whose licenses have been revoked may not receive new licenses from any other boards than those which decreed the revocation, in each case, except with the consent of the respective boards in writing.

Rule 12. Whenever a master desires to act as pilot, and furnishes the necessary evidence of his ability, the local inspectors for the district where the license is issued shall indorse the route on the master's certificate; and, in like manner, when a first-class pilot desires to act as mate, if the inspectors are satisfied of his ability, they shall indorse the fact on the pilot's certificate.

Rule 13. Every steamer running on a daylight route only shall have one first officer of each grade, pilot, and engineer, together with a crew sufficient to perform the ordinary duties of the boat.

Rule 14. Whenever a steamer meets with an accident involving loss of life or

damage to property by sinking, burning, explosion, or other cause, it shall be the duty of the licensed officers of any such steamer to report the same, without delay, to the nearest local board, provided, when from distance it may be inconvenient to report in person, it may be done in writing, and the report sworn to before an authorised magistrate.

Relating to Discipline.

Rule 1. It shall be the duty of an engineer, when he assumes charge of the boilers and machinery of a steamer, to forthwith thoroughly examine the same, and if he finds any part thereof in bad condition caused by neglect or inattention on the part of his predecessor, he shall immediately report the facts to the local inspectors of the district, who shall thereupon investigate the matters, and if the former engineer has been culpably derelict of duty they shall suspend or revoke his license.

Rule 2. It shall be the duty of the master of every inspected steamer carrying passengers on the ocean, lakes, gulf, or bays, when such steamer is under way, to cause to be prepared a station-bill for his own department, and one also for the engineer's department, in which shall be assigned a post or station of duty, for every person employed on board such steamer, in case of fire or other disaster, which station-bills shall be posted in the most conspicuous places on board for the observation of the crew. And it shall be the duty of such master, or of the mate or officer next in command, once at least in each week, to call all hands to quarters, and exercise them in the discipline and use of the fire-pumps, and all other apparatus for the safety of life on board of such vessel, and to see that all the equipments required by law are in complete working order for immediate use; and the fact of the exercise of the crew, as herein contemplated, shall be entered upon the steamer's log book, stating the day of the month and hour when so exercised, and any neglect or omission on the part of the officer in command of such steamer to strictly enforce said rule shall be deemed cause for the revocation of the license of such officer.

Rule 3. It shall be the duty of the mate of every steamer carrying passengers to assign to deck or steerage passengers the space they may occupy on board during the voyage; and to supervise the stowage of freight or cargo, and see that the space so set apart for passengers is not encroached upon. He shall also carefully examine all packages of freight delivered on board for shipment, with a view to detect and prevent any combustible or dangerous articles being delivered on board without his knowledge.

Miscellaneous Rules and Regulations.

Rule 1. Section 41 of the Act of Congress relating to steamers, approved 28th February 1871, shall be so construed as to require the inspection of every vessel propelled in whole or in part by steam, as provided by law, unless the title of the vessel is actually vested in the United States Government, or the vessel is otherwise exempted by the Act.

Rule 2. All kinds of instruments, machines, or equipments now in use on steamers, under the Steamboats Acts repealed by the Act of 28th February 1871, shall be considered as approved by this board when the same are in compliance with the rules made to govern the respective cases in which they are so used; but all kinds of instruments, machines, or equipments, in addition to those above-mentioned, required by the last-mentioned Act, must be presented to this board for examination and approval before the same can be used.

Rule 3. Certificates of inspection signed by one local inspector only shall not be considered valid, nor shall the name of a regular inspector be substituted by that of any other person upon any such certificate. This rule also applies to licenses of pilots and engineers.

Rule 4. Certificates of inspection for one voyage, or for any period less than one year, are not to be issued.

Rule 5. In the inspection of the hulls of steamers, if the inspector shall not have satisfactory evidence, otherwise, of the soundness of the timber, he shall not give a certificate until the hull of the vessel be bored to his satisfaction.

Rule 6. Inspectors may lawfully inspect within their respective districts, upon proper

proper application, any steamer running upon the waters of their district, the certificate of which is about to expire.

Rule 7. The lights of ferry-boats with a rudder on both ends shall be such as, in the opinion of the supervising inspector of the district in which the boats are running, are best adapted to the character of the navigation and to the prevention of accidents by collision or otherwise.

Rule 8. It shall be the duty of the local inspectors to notify the local inspectors of adjoining districts, through the supervising inspector, of all revocations or suspensions of licenses, and also of the names of all persons from whom licenses have been withheld, the names of all steam vessels neglecting or refusing to make repairs when ordered, and the names of all that have been refused certificates, with the reasons therefor; and once in each year local inspectors shall be supplied with a list of all licensed officers, which shall be printed in the annual report of the supervising inspectors.

Rule 9. All the equipment of a steamer, such as buckets, axes, hose, boats, oars, rafts, life-preservers, floats, barrels, tanks, &c., shall be painted or branded with the name of the steamer to which they belong.

Rule 10. Each supervising inspector, in his annual report to the board of supervising inspectors, is required to report the number of steamers inspected in his district, classified and alphabetically arranged, stating when built, where built, amount of tonnage, and of fees which should be collected at the custom house; the number of masters, mates, pilots, and engineers licensed, with their grade, number of issue, number of licenses and money received therefor, also all fines collected; these lists to be made on blanks to be furnished by the Department. He is also required to report all expenditures in his district, including salaries, and travelling and incidental expenses; he is also required to report all occurrences, casualties, &c., such report to be so made as to accord in form with the tabular statement published in the Nineteenth Annual Report; also any other occurrences and matters which, in his opinion, will add value to the service and interest to the report.

Rule 11. Whenever any inspector shall find it necessary, in conducting his investigations, or in the performance of any of his duties, to obtain testimony from the inspectors of other districts, he shall request the same through the supervising inspector.

Rule 12. Local boards shall report forthwith to their supervising inspectors, in detail, all accidents of a serious character, such as collisions, foundering, sinking, fires, and all other casualties of interest to, or affecting, the steamboat service in their respective districts.

They shall also report quarterly all cases of revocation, suspension, and refusal of licenses to masters, mates, pilots, and engineers, with the reasons therefor; all examinations into alleged violations of the steamboat law, with their decisions thereon; steamers inspected, with their class and tonnage; steamers refused inspection, their class and tonnage, and the reasons for such refusal; steamers gone out of service, with their class and tonnage; the number of masters, mates, pilots, and engineers licensed; grade of licenses and money received therefor, during the quarters ending December 31, March 31, June 30, and September 30 of each year.

The quarterly reports shall be made on or immediately after the first days of January, April, July, and October in each year.

On or before the 5th day of January in each year, alphabetical lists, arranged according to class and grade, of the names of steamers inspected during the year, with their tonnage; when and where built; the name and grade of masters, mates, pilots, and engineers licensed during the year; together with all the events affecting the steamboat inspection service and occurring in their districts during the year, are to be reported in a tabular form, and according to blanks to be furnished by the Treasury Department.

Rule 13. Steamers of 1,000 tons and under, carrying passengers in the night time, navigating rivers, lakes, bays, or sounds, shall at all times, from sundown to sunrise, have a watchman on duty on each deck below the hurricane deck; and all steamers of more than 1,000 tons shall have two watchmen on the lower deck, one on the main deck, and two on the state-room deck; and all steamers on western and southern rivers shall have an additional watchman on the

hurricane deck. All sea-going steamers shall have a watchman on duty at all times during the night in each cabin and in the steerage.

Rule 14. All ferry-boats carrying passengers shall be equipped as passenger steamers, in compliance with the law, and to such extent as, in the opinion of the inspectors, shall be deemed just, according to the average number of passengers carried per trip.

GENERAL PROVISION.

The foregoing rules and regulations adopted by the board of supervising inspectors at a special meeting thereof, held at Washington, D. C., in the month of April 1873, having been approved by the Secretary of the Treasury, have the full force of law, and will be observed and followed accordingly by all concerned.

Any previous rule, regulation, or instruction in conflict therewith will be regarded as thereby repealed.

D. D. Smith,
Supervising Inspector General.

Approved:
Wm. A. Richardson,
Secretary of the Treasury.

30 June 1873.

RULES prescribing certain FOG SIGNALS to be observed by Steamers, Sailing Vessels, and other Craft.

EVERY steamer, when under way, shall use a steam whistle. Sailing vessels, and all other craft propelled by sails, shall use a fog horn.

Whenever there is a fog, whether by day or night, the fog signals described below shall be sounded.

Sailing vessels and every craft propelled by sails upon the ocean, lakes, and rivers shall, when on their starboard tack, sound one blast of their fog horn; when on their port tack they shall sound two blasts of their fog horn; when with the wind free or running large they shall sound three blasts of their fog horn; when lying to or at anchor they shall sound a general alarm. In each instance the above signals shall be sounded at intervals of not more than two minutes.

Sailing vessels, when not under way, and anchored or moored in the channel or fairway of commerce, shall sound the general alarm signal at intervals of not more than two minutes; and all steamers navigating in a fog or thick weather shall, by the rules governing pilots, sound their steam whistle at intervals of not more than one minute.

Sailing vessels shall at all times, on the approach of any steamer during the night time, show a lighted torch upon that point or quarter to which such steamer shall be approaching. And upon any craft navigating rivers without being in tow of a steamer, such as rafts, flat boats, wood boats, and other like craft, they shall sound a fog horn at intervals of not more than two minutes.

It shall at all times be the duty of steamers to give to the sailing vessel, or other craft propelled by sails, every advantage, and keep out of her way.

INSTRUMENTS, MACHINES, and EQUIPMENTS approved for use on STEAM VESSELS.

Life Rafts.

Metallic raft, presented by Mr. O. R. Ingersoll, of New York.
Metallic raft, presented by Hon. H. Calkins, of New York.
Metallic raft, presented by Frazee Life Raft Company, New York.
Vulcanized-rubber raft, called Monitor life-raft, presented by Monitor Raft Company, New York.
India-rubber raft, presented by Torrey & Co., of New York.

Auxiliary Life Raft.

Life-saving mattress, presented by J. W. Wotton, of New York.
Detachable deck, presented by Joseph Sawyer, of Detroit, Michigan.

Life Rafts and Life Boats.

Automatic self-righting and baling, presented by P. R. Beaupre, of Metropolis, Illinois.
Self-righting and baling, presented by Mr. Stoddars.
Davis's life raft.
Clark's life raft.
Shear's self-baling and self-righting boat.

Life Preservers.

Cork life preservers, presented by E. Clark, J. A. Seamans, O. R. Ingersoll, and M. A. Scott.

Life-Saving Mattresses.

Torrence's life-saving mattress.
Mrs. H. B. Mountain's life-saving mattress.
Adams's life-preserving mattress.
Pack and Van Horn's life-preserving mattress.

Floating Anchors or Drags.

Marine drags, presented by Joseph Humphries and J. Faunce.
Umbrella (invented by Captain William Skiddy).

Marine Drags.

Ingersoll's marine drag.
Viger & Sawyer's marine drag.
Edson's marine drag.
Wilson's marine drag.

Steam Pumps.

Lansdell's double-suction steam siphon, presented by H. S. Lansdell, New York.
Coll's single-suction steam siphon, presented by Mr. Coll, Pittsburgh.
A. Sluthouer, New Philadelphia, Ohio, fire and bilge pump.

Fire Extinguishers.

D. B. Waggerman's (Gardner).
The Babcock fire extinguisher.
The National fire extinguisher, presented by J. E. Thomson.
The Champion fire extinguisher.
Holloway fire extinguisher.
Ætna fire extinguisher.

Devices for removing Sediment from Boilers.

Sediment agitator, presented by B. W. Reynolds, Evansville, Indiana.
John C. McLaughlin, Pittsburgh, Pennsylvania.
Armstrong's vortex skimmer.
Ordinary blow-off cocks and mud valves.

Recording and other Steam Gauges.

E. H. Ashcroft's, Boston, Massachusetts.
D. P. Davis, New York.
Greenwood & Co., Cincinatti, Ohio.
Hargrave's "Columbia."
E. Clarke, Louisville, Kentucky.
M. B. Edson, New York.
Post & Company's, of Cincinnati.
Holt's patent recording gauge.

Low-water Alarm Indicators.

Daniel Weihl, Cincinnati, Ohio.
W. A. Bradford, Cincinnati, Ohio.
Hiram Kimball, Pittsburgh, Pennsylvania.
L. L. Lee.
Massey's.
E. H. Ashcroft, Boston, Massachusetts.
M. Neynaber.
Selah Dustin, Detroit, Michigan.
J. D. Lynde, Philadelphia, Pennsylvania.
James E. Thompson, "American."
Swain's low-water alarm indicator.
Dustin's low-water alarm indicator.

Safety-Valves.

H. G. Ashton, East Cambridge, Massachusetts.
Case & Baillie, Detroit, Michigan.
J. D. Lynde, Philadelphia, Pennsylvania.
Richardson & Co., Troy, New York.
Dry-Dock Engine Works, Detroit, Michigan.

Feed-water Heaters.

Thomas Roberts, Baltimore, Maryland.
Thomas Snowden, Pittsburgh, Pennsylvania.
Doyle & Reybold, Delaware City, Delaware.
Charles G. Fisher.
H. C. Haskell, Albany, New York.

Water-Elevators.

Arthur's improved water-elevator.

Fog-Horns.

Fog-horns, presented by J. R. Anderson, of New York, and by J. Van Trump, of Boston.

Miscellaneous.

Torch for sailing-vessels, Nathan C. Page.
Polhamus's safety-tank for fire-room floors.

BOILER EXPLOSIONS.

PAPERS relating to EXPERIMENTS concerning BOI
EXPLOSIONS, conducted in 1874, under the Mana
ment of the late Superintendent Inspector Gene
of Steam Vessels of the Treasury Department
Washington, together with the STATUTORY RUL
concerning the Working of BOILERS in STE
VESSELS in force in the UNITED STATES.

(*Sir Charles Adderley.*)

Ordered, by The House of Commons, *to be Print*
10 *April* 1876.

Under 4